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OFFICE OF POPULATION CENSUSES AND SURVEYS  
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# Wheelchairs and their users

A survey carried out on behalf of the  
Department of Health and Social Security

David Fenwick

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OFFICE OF POPULATION  
SOCIAL SURVEYS

# Wheelchairs and their users

A survey among users of National Health Service wheelchairs in England and Wales, to establish their characteristics and attitudes to their wheelchairs and to the operation of the wheelchair service.

David Fenwick

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# Contents

	<i>Page</i>
<b>1 Introduction</b>	
Purpose of the inquiry	1
Selecting the sample of patients	1
The questionnaire	2
<b>2 General summary of findings</b>	3
<b>3 The patients</b>	
.1 Personal characteristics	5
Sex and age	5
Marital status	6
Households	6
Employment	7
.2 Disabilities and their effects	7
Patients' disabilities	7
Effects on limbs, back and neck	8
Ability to walk	8
Difficulties with basic activities	9
.3 Anthropometric measurements	9
<b>4 Wheelchairs and their use</b>	
Introduction	15
.1 Number of wheelchairs on issue	15
Wheelchairs on issue to patients of all ages	15
Wheelchairs on issue to adult wheelchair patients	15
Non-NHS wheelchairs	16
.2 Amount used	16
Introduction	16
Collecting data on amount used	16
Non-use	16
Wheelchairs temporarily out of use	16
Amount used	17
Differences between models	19
.3 Occasions on which wheelchairs are used	19
<b>5 Patients' views on their wheelchairs</b>	
Introduction	21
.1 Overall satisfaction	21
.2 Factors affecting comfort	22
Extent of discomfort	22
Sleeping in wheelchairs	22
Cushions	23
Seat width	23
Seat depth	24
Backrests	24
Footrests and footboards	25
.3 Operating difficulties	25
Transferring to and from wheelchair	25
Hand-propulsion	26
Steering	26
Operating the brakes	27
Folding wheelchairs	28
.4 Follow-up of grievances	28



	<i>Page</i>
<b>6 Patients' views on the wheelchair service</b>	
A description of the organisation	31
Overall satisfaction	31
<b>.1 Problems of recommendations</b>	32
Introduction	32
The first steps taken in getting the chair	33
The role of the Appliance Centre and the clinic	33
The expectations of those who did not visit an Appliance Centre or clinic	34
Patients' visits to Appliance Centres or clinics	34
Comparing Appliance Centres with clinics	35
Delivery period	35
<b>.2 Instruction</b>	36
Instruction booklets	37
<b>.3 Repair and maintenance</b>	38
The condition of wheelchairs and their repair	38
<b>.4 Some comparisons between Appliance Centres</b>	39
<b>7 Other aids to mobility</b>	
Walking aids	40
Other mobility aids	40
<b>8 Housing and problems of mobility within the home</b>	
Introduction	42
Institutions	42
Type and age of accommodation	42
Tenure	42
Household size and density of occupation	42
Inaccessibility	43
Entering or leaving accommodation when in a wheelchair	44
Adaptations to housing	44
Reaching electric plugs and switches	45
Sitting at a table	45
<b>9 Mobility outside the home</b>	
Introduction	46
Occasions used	46
Transport	46
<b>10 Patients who are also drivers</b>	
Introduction	47
Frequency of use	47
Occasions used	47
The orange car badge scheme	47
Transferring between wheelchair and car	48
Stowing wheelchairs in cars	48
<b>Appendices</b>	
A Disabilities diagnosed when wheelchair was prescribed	49
B Height and weight at time of prescription	50
C Standard features of National Health Service wheelchairs	53
D Dimensions of National Health Service wheelchairs	54
E Patients with invalid three-wheeler cars	55
F The questionnaire	56

# Tables

<i>Table</i>	<i>Page</i>
1 Types of appliance on issue	2
2 Response rate	2
3 Wheelchair patients per 1,000 population in England and Wales - June 1973	5
4 Impaired persons per 1,000 population in private households in Great Britain - 1969	5
5 Age and sex of adult wheelchair patients	5
6 Marital status of adult wheelchair patients compared with the general population	6
7 Sizes of households of adult wheelchair patients compared with those of the general population	6
8 Social class of adult wheelchair patients compared with the general population	6
9 Full-time and part-time employment of adult wheelchair patients compared with the general population	7
10 Disability diagnosed when wheelchair was prescribed	7
11 Disability analysed by sex and age of patient	8
12 Limitations in the use of legs, knees, hips, arms and hands	8
13 Limitations in the use of the back and neck	8
14 Ability to walk short distances analysed by disability	9
15 Proportion needing help for certain basic activities	9
16 Deformities affecting measurements	11
17 Patients' measurements in centimetres	11
18 Patients' measurements in centimetres (continued)	12
19 Patients' measurements in inches	13
20 Patients' measurements in inches (continued)	14
21 Number of wheelchairs on issue per 1,000 patients analysed by sex, age and disability of patient	15
22 Total number of hours a week a patient spends in a wheelchair indoors and outdoors (November/December)	17
23 Total number of hours a week a patient spends in a wheelchair indoors and outdoors (November/December) analysed by sex and age of patient	17
24 Total number of hours a week a patient spends in a wheelchair indoors and outdoors (November/December) analysed by disability of patient	18

25	Average number of hours a week a patient spends in a wheelchair (November/December) analysed by number of wheelchairs	18
26	Average number of hours a week a patient spends in a wheelchair (November/December) analysed by use in legs	18
27	Average number of hours a week a patient spends in a wheelchair (November/December) analysed by whether or not patient walks short distances	18
28	Total number of hours per week wheelchair is used (November/December) analysed by model type	19
29	Use of wheelchairs for work	20
30	Occasions on which patients use wheelchairs outdoors	20
31	Most frequently mentioned bad points of wheelchairs	21
32	Aches and pains when sitting in the wheelchair analysed by model type	22
33	Aches and pains when sitting in the wheelchair analysed by total number of hours per week wheelchair is used	22
34	Proportion of wheelchairs with seat, side and back cushions	23
35	Seat widths considered too wide or too narrow by hip width of patient and model of wheelchair	23
36	Seat width minus hip width by percentage considered too wide and too narrow	24
37	Back to underside of knee minus seat depth by percentage considered too deep and too short	24
38	Backrest angle by model type	24
39	Aches and pains in back by whether backrest angle is too upright, too much at an angle or just right	25
40	The use and safety of footrests and footboards analysed by model	25
41	Help needed in transferring to and from wheelchair analysed by model type	26
42	Help needed in transferring to and from wheelchair analysed by use of arms	26
43	Difficulty with handrims analysed by use of arms	26
44	Difficulties with steering hand-propelled wheelchairs analysed by use of arms	27
45	Pushers' difficulties with turning corners outdoors analysed by model type	27
46	Patients' difficulties with operating brakes analysed by use of arms	27
47	Frequency of folding analysed by model type	28
48	Follow-up of grievances	29
49	Level of satisfaction with wheelchair service by satisfaction with own wheelchair	32

<i>Table</i>	<i>Page</i>
50 Level of satisfaction with wheelchair service by number of years as a wheelchair patient	32
51 Patients' suggestions for improving the wheelchair service	32
52 Person who first suggested chair was needed by whether or not it was patient's first chair	33
53 The part played by doctors and technical officers by whether or not it was the patient's first chair	33
54 Proportion of recommendations involving a general practitioner analysed by whether wheelchair was obtained before 1972 recommendations	33
55 Whether visit to Appliance Centre or clinic would have been useful for patient or person who pushes the chair	34
56 Satisfaction with wheelchair by whether patient visited an Appliance Centre or clinic	35
57 Comparing usefulness of Appliance Centres with that of clinics	35
58 Comparing procedure at Appliance Centres with that at clinics	35
59 Length of delivery period and its effect on mobility by whether or not it was the patient's first chair	36
60 Knowledge gained from reading an instruction booklet	37
61 Whether an instruction booklet would have been useful	38
62 Comparison of repairs said to be needed with repairs said to have been done in the last year	38
63 The proportions of chairs said to be in need of repair and to have been repaired in the last year analysed by knowledge of repair service	38
64 Some comparisons between Appliance Centres	39
65 Possession and use of walking aids	40
66 Average number of hours a week a patient spends in a wheelchair (November/December) analysed by the use of walking aids	40
67 Possession and use of other mobility aids	41
68 Type of accommodation occupied by adult wheelchair patients	42
69 Age of accommodation analysed by whether purpose-built for the disabled or elderly	42
70 A comparison of household size and density of occupation for adult wheelchair patients and the general population	43
71 Factors preventing access to WC, bathroom and kitchen	43
72 Access to accommodation analysed by whether purpose-built for the disabled or elderly	43
73 Access to accommodation analysed by whether patient uses wheelchair indoors	44

74 Whether had difficulties with entering or leaving accommodation when in a wheelchair	44
75 Most frequently suggested improvements to accommodation	45
76 Whether had difficulties with reaching switches and electric plugs	45
77 Travelling difficulties and access problems when visiting friends, going to shops and visiting theatres or cinemas	46
78 Use of wheelchairs when travelling by bus, train or car	46
79 Frequency of use of invalid three-wheeler cars and cars adapted for use by disabled drivers	47
80 Occasions on which invalid three-wheeler cars and cars adapted for use by disabled drivers are used	47
81 Whether had difficulties with transferring between wheelchair and car analysed by type of car	48
82 Whether had difficulties with stowing wheelchair in car analysed by type of car	48
83 Disabilities diagnosed when wheelchairs were prescribed	49
84 Height in centimetres analysed by sex and age	50
85 Height in inches analysed by sex and age	50
86 Weight in kilograms analysed by sex and age	51
87 Weight in pounds analysed by sex and age	51
88 Weight in kilograms analysed by height in centimetres	52
89 Weight in pounds analysed by height in feet and inches	52
90 Standard features of National Health Service wheelchairs	53
91 Dimensions of National Health Service wheelchairs	54
92 Sex and age of drivers of invalid three-wheeler cars	55
93 Disabilities of drivers of invalid three-wheeler cars	55

#### Note to tables

An asterisk (\*) in the tables represents 0.5 per cent or less.

## Figures

Figure	Page
1 Measurements taken and derived	10
2 Dimensions of chairs	54

# 1 Introduction

## Purpose of the inquiry

This survey was requested by the Disablement Services Branch of the Department of Health and Social Security who are responsible for the issue of wheelchairs under the National Health Service (NHS). The Survey's objectives were:

- a) to describe NHS wheelchair users in terms of age, sex, disability and other characteristics,
- b) to find out the extent to which NHS wheelchairs are considered satisfactory and to suggest any possible improvements in their design,
- c) to take body measurements of the patients to help in the design of future wheelchairs,
- d) to discover any inadequacies in the wheelchair service with regard to the prescribing of the chairs and their maintenance,
- e) to make some assessment of the extent to which the patient's environment limits mobility.

It was decided to limit the inquiry to non-powered wheelchair<sup>1</sup> patients aged 18 years and over in England and Wales.

## Selecting the sample of patients

Since 1971 any NHS doctor, whether working in a hospital or as a general practitioner, can recommend the issue of an NHS wheelchair (prior to 1971 only consultants in hospitals could do so). This recommendation is dealt with at the nearest Appliance Centre, of which there are 23 in England and Wales. Sixteen of the 23 centres also deal with artificial limbs and are known as Artificial Limb and Appliance Centres.

Two separate filing systems are maintained at the Artificial Limb and Appliance Centres, one for patients fitted with artificial limbs and a second for those issued with appliances, there being appropriate cross-referencing where necessary. Since our inquiry required a sample of adults with non-powered wheelchairs, it had clearly to be drawn from the second system, which in addition to this group covered both children and those with powered wheelchairs, spinal carriages, tricycles, invalid three-wheeler cars, converted cars, or private car allowances. Not only was it easier to sample

throughout such a system, but by doing so we have been able to carry out some limited analyses on all types of wheelchair users and on those with invalid three-wheeler cars.

So although we aimed eventually to interview only about 1,000 adult wheelchair patients, we started by drawing a sample of over 2,000 appliance patients of all ages.

Statistics on the number of patients served by each centre were not readily available so in designing the sample we used the number of wheelchairs on issue, which was known. Cost and efficiency considerations called for a two-stage sample design, the first stage consisting of a sample of Appliance Centres. In the absence of other information we divided the sample between England and Wales in proportion to the number of wheelchairs issued in the two countries.

In England we selected 7 centres out of 21 with probability proportional to the number of wheelchairs issued. In Wales one of the two centres was selected. Within each selected centre the sampling fraction was so adjusted as to give an equal probability of selection for each appliance patient.

The files of appliance patients are kept in alphabetical order of the patient's surname. The amount of information contained in the records varies considerably depending on the amount contained in the original prescription and on the extent to which any papers considered unnecessary for administration purposes have been sifted out. The files should, however, always contain the prescription form, receipts and other papers for all appliances on issue at the current time together with all financial papers regarding extras, modifications, and repairs, not more than five years old. The prescription form generally includes medical information on the height and weight of the patient and on the disability from which he or she was suffering at the time of prescription, together with the type of wheelchair recommended and any extras or modifications thought necessary.

In deciding what information to take from the files priority was given to recording the information needed to determine which patients were eligible to take part in the interview survey, eg the present age, name and address of the patient and the appliances said to be on issue. In addition we chose to record the medical information available on height, weight and disability and whether or not the patient resided in an institution.

<sup>1</sup> Patients with only a powered wheelchair constitute about 1% of all wheelchair patients.



So from the records at the 8 centres we first of all selected (in June 1973) a sample of 2,238 patients of any age and with any type of appliance. The types of appliance on issue to them are shown in table 1. Because some patients had more than one type of appliance<sup>1</sup>, the percentages in this table add to more than 100.

Table 1 Types of appliance on issue

	%
Non-powered wheelchair(s)	87
Powered wheelchair	4
Spinal carriage	*
Pedal- or hand-propelled tricycle	2
Invalid three-wheeler car	12
Converted car or allowance†	8
<i>Base - patients of all ages with any appliance</i>	<i>2238</i>

† This is a slight underestimation (by about 1%) because some centres kept the records for patients with only a private car allowance separate from the appliance patients; as a result some patients with allowances only were omitted from the sampling.

There were 1,955 patients (87%) who had one or more non-powered wheelchairs. Of this group 1,636 proved to be adult patients aged 18 and over.

This sample of 1,636 adult wheelchair patients was larger than we required so it was first reduced to 1,150 by deleting patients' names at random. We estimated that this would give us about 1,000 interviews allowing for two types of loss.

We had decided to let six months elapse between selecting the patients and interviewing them so that they all would have adequate experience of using a wheelchair. In the event we lost 122 patients due to changed circumstances during the six months, much arising from the deaths of patients. This left 1,028 patients who could be considered eligible for our inquiry. Further losses occurred as shown in table 2.

Table 2 Response rate

	Number	%
Interview obtained	978	95
No interview -		
refusal	20	2
others	30	3
<i>Base - eligible patients</i>	<i>1028</i>	<i>100</i>

Only 2% refused to co-operate in the inquiry and we obtained interviews in all but another 3%, so non-response does not constitute any problem in this survey. However we did not always succeed in getting interviews with the patients themselves. In surveys dealing with health one cannot afford to lose those who are too ill to be interviewed. So of the 978 interviews 69% were obtained wholly from the patients, 18%

<sup>1</sup> Of those with powered wheelchairs 77% also had a non-powered wheelchair. Substantial proportions of those with pedal - or hand-propelled tricycles (60%), invalid three-wheeler cars (47%) and converted cars or allowances (40%) also had a non-powered wheelchair.

partly from the patients and 13% entirely from people who knew the patients well enough to be able to answer questions on their behalf. These proxy interviews were only allowed in cases where patients were too ill to be interviewed. In most cases the proxy was either the spouse of the patient or another relative. The interviewing was carried out during November and December, 1973.

## The questionnaire

Following usual Social Survey practice a great deal of background work and testing took place before the questionnaire was finalised. Firstly we conducted completely unstructured interviews which were then used to draft a pilot questionnaire. This pilot questionnaire was then tested and any amendments felt necessary were made before the final version was administered to our sample of adult wheelchair patients.

Some of the questions on the questionnaire related to the wheelchair while the remainder related to the patient. Because a patient could have had more than one wheelchair, the questionnaire was laid out in such a way as to enable the interviewer to record information separately for each chair.

The topics covered by the questionnaire fell into seven fairly well defined sections:

- First of all a patient was asked about the physical limitations imposed by his or her disability.
- Then his or her wheelchair was discussed. We asked a number of questions on the procedure a patient went through to get the chair and then asked questions on the different parts of the chair.
- In the next section we investigated wheelchair usage. In particular, we collected information on the number of hours a week a wheelchair was used, and investigated non-use.
- Then, if a patient drove either an invalid three-wheeler or a car adapted for disabled drivers we asked about any difficulties he or she may have had either in transferring to and from the vehicle or in stowing the chair in the vehicle.
- After this a patient was asked some questions on the wheelchair service. These included questions on the repair of the wheelchair and on whether the patient felt the method of providing and maintaining wheelchairs could be improved.
- In the next section we inquired about a patient's accommodation.
- Finally we took fourteen anthropometric measurements of the patient.

The questionnaire is reproduced in Appendix F.

## 2 General summary of findings

### The patients

From the data collected at the Appliance Centres, we estimated that in June 1973 there were about 113,000 patients of all ages living in England and Wales who had on issue at least one non-powered NHS wheelchair; this represents a prescription rate of 2.3 wheelchair patients per 1,000 population.

We are, however, only concerned with an estimated total of some 101,000 patients, since about one in ten were under 18 years of age and hence were not included in this enquiry. Because the prescription rate for chairs was generally higher among women than among men we found that there were nearly twice as many women as men in our sample of adult wheelchair patients (65% compared with 35%); in addition, the women were also, on average, older than the men (66 years 7 months compared with 58 years 5 months).

Not surprisingly, a relatively large proportion (16%) of adult wheelchair patients were living in institutions; those who were not, included just over one in ten (13%) who were living alone. In all, about a half (52%) were married.

Clearly, compared with the general population, wheelchair patients have difficulty in obtaining jobs, for we found that, of those below retirement age, members of the general population were more than five times as likely to be in employment as were wheelchair patients (72% compared with 14%).

Using the records kept at the Appliance Centres, we were able to classify patients by the type of disability diagnosed at the time of prescription; disabilities most frequently diagnosed were arthritis and related conditions (29%), cerebrovascular diseases (18%) and organic nervous diseases and resulting effects (16%).

### Wheelchairs and their use

Our calculation of the total number of powered and non-powered wheelchairs on issue was as high as 137,000; this was because about a fifth of patients had more than one wheelchair. Expressed in another way it can be shown that there were 44 powered and 1,181 non-powered wheelchairs on issue for every 1,000 patients of all ages.

Data collected at the interview showed that among the fifth of adult patients who claimed to have more than one chair were 5% who said they had powered chairs

and 5% who said they had chairs obtained privately. It is worth noting that of those who obtained wheelchairs privately, only a small proportion gave reasons which implied criticism of NHS wheelchairs.

We found that 6% of adult patients could be classified as non-users because they had not used a wheelchair for at least six months prior to the interview and were not expecting to use one in the future. A further 6% could be classified as temporary non-users. It was observed that very few of the wheelchairs permanently out of use could be attributed to faults in the chair. We concluded that the extent and nature of non-use raised the question of whether any means could be found of retrieving unused NHS wheelchairs and whether this was worthwhile.

Of those who could be classified as users our calculations showed that, although a greater proportion of patients used a wheelchair outdoors than indoors (74% compared with 58%), the majority of usage, in terms of number of hours a week, took place indoors. Thus, on average, we calculated that a patient spent 32.0 hours a week in a wheelchair indoors and 4.4 hours a week in a wheelchair outdoors, giving a total average usage of 36.4 hours a week. The average weekly use was greatest among patients who had no use at all in their legs, among those with jobs and among patients who had more than one wheelchair.

### Patients' views on their wheelchairs

In answer to a general question on how satisfactory patients found their wheelchairs, 49% of wheelchairs were said to be very satisfactory, 42% satisfactory and only 9% not very satisfactory. There was very little variation between models.

Because wheelchair patients frequently suffer from disabilities causing discomfort which no design of chair is likely to alleviate, it came as no surprise to find that aches and pains were experienced in a third (34%) of wheelchairs. However, it appeared that some discomfort could be attributed to bad design; for example, there may be an unmet need for cushions, for not only did we find that patients felt that cushions would have alleviated much of their pain, but we also found that only a half of all cushions used had been supplied by the NHS. In addition, we concluded that the wheelchair service may wish to review its policy with regard to the material used for covering their cushions, for we found that nearly a quarter (22%) of plastic-covered cushions (as supplied by the DHSS) were described as being too hot and clammy.



Other factors leading to discomfort included backrests which were too low or at the wrong angle, seats which had the wrong dimensions or sagged in the middle, and footrests and footboards which were badly designed.

Well over two thirds (72%) of wheelchairs in use were designed to be propelled by the patients themselves using handrims; however, we found that for 42% of such chairs the handrims were not used at all. This meant that there were about 36,000 hand-propelled wheelchairs on issue to adult wheelchair patients who never used handrims. An analysis of the extent to which patients had use of their arms and hands showed that less than a half (41%) of hand-propelled wheelchairs were issued to patients who had complete use in both arms and hands; this raised the question of whether a wheelchair without a provision for hand-propulsion would have been more suitable.

#### **Patients' views on the wheelchair service**

Perhaps not surprisingly, patients' levels of overall satisfaction with the NHS wheelchair service were closely linked to their levels of satisfaction with their own wheelchairs; a half (49%) were very satisfied with the service, 44% satisfied and only 7% not very satisfied.

Less than a third (30%) suggested improvements which could be made in the provision and maintenance of wheelchairs by the National Health Service; suggestions included regular visits to patients by officials from the Appliance Centres (7%), shorter delivery periods (4%), quicker repair services (4%) and tuition on the use and maintenance of wheelchairs (3%).

Only one in ten (11%) prescriptions included a visit by the patient to an Appliance Centre or clinic; it was clear from the low level of satisfaction with these visits that a review should be carried out. Furthermore, since as many as a fifth of visitors had travelling difficulties, the service should perhaps consider extending the circumstances in which a patient is seen at home rather than called to an Appliance Centre or clinic.

The survey clearly showed that there were often considerable delays in supplying wheelchairs; for instance, over a fifth (22%) of chairs took at least eight weeks to be delivered. In the circumstances, the DHSS might usefully examine why these delays occur to discover what steps can be taken to shorten the waiting period.

We also found that upon receiving the chair, there were often (in about a fifth of cases) problems in learning to use it. Thus in many cases it would have

been useful if more instruction on how to use wheelchairs had been given; in particular, we concluded that Disablement Services Branch may wish to consider both redesigning the instruction booklets at present handed out and providing them more extensively.

Since 13% of wheelchairs in use were said to be in need of repair, it appeared that the wheelchair service was not entirely successful in keeping its wheelchairs in good working order. In terms of the total number of wheelchairs on issue to adult patients this represented approximately 12,500 which were in need of repair.

#### **Other aids to mobility**

As well as using wheelchairs, we found that just under two-thirds (61%) of patients used other aids to mobility; they included 34% who used walking sticks and 20% who used walking frames. The average weekly use of wheelchairs was only 22.4 hours among patients who used a walking aid compared with 58.4 hours among patients who did not.

#### **Housing and the problems of mobility within the home**

As many as one in six patients lived in institutions; of those who were living in private households, 15% were in purpose-built flats or bungalows for the disabled or elderly.

We found that 3% of patients in private households were confined to one room because of their disability and a further 30%, while not confined to one room, were unable to get to all the rooms in their accommodation. It follows that only two-thirds (67%) had full access to their accommodation. Separate analyses for different types of rooms showed that a quarter of patients were unable to get to the WC, 21% were unable to get to the bathroom and 10% could not get to the kitchen.

#### **Mobility outside the home**

Of those patients who used a wheelchair outdoors, 64% used one when visiting friends, 59% when going to the shops and 17% when visiting a theatre or cinema. Only in the case of theatres and cinemas did a substantial proportion of patients say they did not use their wheelchairs because of access problems or travelling difficulties.

#### **Patients who are also drivers**

Twelve per cent of our sample of adult wheelchair patients had invalid three-wheeler cars (8%) or cars adapted for use by disabled drivers (4%). Only one in six (17%) of these patients said they had difficulty in transferring from their chair to their car; on the other hand as many as 51% said they had problems with stowing their wheelchairs in their vehicles.

# 3 The patients

## 3.1 Personal characteristics

### Sex and age

We have already mentioned that, although we aimed to interview only about 1,000 adult wheelchair patients, we drew an initial sample of over 2,000 appliance patients of all ages which included 1,955 patients who had at least one non-powered wheelchair. By doing so we were able to estimate the number of non-powered NHS wheelchair patients per 1,000 population in England and Wales. Our calculations produced an estimated rate of 2.3 wheelchair patients per 1,000 population; this means that in June 1973 there were about 113,000 patients in England and Wales who had been issued with non-powered NHS wheelchairs. Our estimate of the number of non-powered wheelchairs on issue was 132,000; a higher figure than the number of patients because approximately a fifth of patients had two wheelchairs.

In table 3 we give the estimated prescription rates for different age-groups. Not surprisingly, it shows that the prescription rate increases with age for both sexes; a slight fall between childhood and early adulthood corresponding to a failure to survive of some of those born with disabilities, is followed by an increase which accelerates for older age-groups reaching a maximum among patients aged 80 years and over of 13.4 patients per 1,000 population.

Table 3 Wheelchair patients per 1,000 population in England and Wales - June 1973

Age in years	Males	Females	Males and females
Up to 9	0.9	1.1	1.0
10 - 19	1.2	0.8	1.0
20 - 29	0.7	0.5	0.6
30 - 39	0.7	1.1	0.9
40 - 49	0.9	1.5	1.2
50 - 59	1.8	2.6	2.2
60 - 69	3.9	5.0	4.5
70 - 79	7.4	9.3	8.6
80 and over	11.7	14.0	13.4
All ages	1.8	2.7	2.3

Note: based on the sample drawn at the Centres.

Looking at males and females separately, we find that for all age-groups, apart from those aged 10 to 29 years, there was a higher rate of prescription among females; thus, on average, 2.7 per 1,000 females had non-powered NHS wheelchairs compared with only 1.8

per 1,000 males. Mainly because of their higher prescription rate, we find that 62% of those with non-powered NHS wheelchairs were female. The reason for the generally higher rate of prescription for females is not clear but may be due to the higher incidence of impairment among women. For, if we compare the number of impaired adults per 1,000 of the population in private households (see table 4) with the number of wheelchair patients per 1,000 population (see table 3) we find that for both rates, females overtake males during middle age.

Table 4 Impaired persons per 1,000 population in private households in Great Britain - 1969

Age in years	Men	Women	Men and Women
16 - 29	10.0	7.9	8.9
30 - 49	30.2	25.6	27.9
50 - 64	85.6	84.6	85.0
65 - 74	211.4	227.1	220.7
75 and over	316.2	409.0	378.0
All adults	66.7	88.2	78.0

Note: based on Table 2, page 5 of a national survey, *Handicapped and Impaired in Great Britain*, Harris A. SS418 HMSO 1971

In the following table we give the age and sex distributions of our interviewed sample of adult wheelchair patients, that is, of patients who were aged 18 years and over. We see that these distributions reflect the variable prescription rates for the different age-groups of men and women in the general population; thus not only were there nearly twice as many women as men in our interviewed sample (65% compared with 35%), but they were also, on average, older than the men (average age 66 years 7 months compared with 58 years 5 months).

Table 5 Age and sex of adult wheelchair patients

Age in years	Males	Females	Males and females
	%	%	%
18 - 29	12	3	6
30 - 39	5	5	5
40 - 49	10	7	8
50 - 59	16	12	14
60 - 69	26	23	24
70 - 79	23	28	26
80 and over	8	22	17
Average age	58 yrs 5 mths	66 yrs 7 mths	63 yrs 10 mths
Base (=100%)	339	639	978
- adult wheelchair patients			

**Table 6** Marital status of adult wheelchair patients compared with the general population†

Age in years	Males			Females			Males and females		
	Married	Widowed divorced separated	Single	Married	Widowed divorced separated	Single	Married	Widowed divorced separated	Single
18 - 29	% 13 46	2 *	85 54	5 68	5 1	90 31	10 64	3 *	87 36
30 - 39	% 28 86	- 2	72 12	48 89	7 3	45 8	40 87	4 3	55 10
40 - 49	% 69 87	3 2	28 11	72 84	4 6	24 10	70 86	4 4	26 10
50 - 59	% 78 87	7 5	15 9	64 78	16 13	20 9	70 82	12 12	18 9
60 - 69	% 84 84	8 8	8 8	59 55	30 27	11 18	68 68	22 18	10 14
70 - 79	% 72 72	25 21	3 7	39 33	50 52	11 15	49 48	42 40	9 12
80 and over	% 57 48	39 46	4 6	17 12	75 72	8 16	24 22	69 65	7 13
All ages	% 65 74	13 5	22 21	44 67	40 17	16 16	52 71	30 11	18 18

† The percentages shown in *italics* relate to the population of England and Wales aged 18 years and over taken from the 1971 Census of Population

## Marital status

Just over a half (52%) of the adult wheelchair patients in our interviewed sample were married. Those who were not, consisted of 30% who were widowed, divorced or separated, and 18% who were single.

A comparison with the general population shows that the overall propensity to be married was lower among wheelchair patients than among members of the general population (52% compared with 71%); this was especially so of the younger age-groups where a high proportion had been born with disabilities (see table 6). However, we can see from the same table that the difference in the overall proportion married can be partly accounted for by the age structure of our adult wheelchair patients; for, not unsurprisingly, we found that after an initial increase in the proportion married among the younger age-groups, there was then a decrease which corresponded to a steady increase in the proportion who were either widowed, divorced or separated.

## Households

As we would expect, a relatively large proportion (16%) of adult wheelchair patients were living in institutions such as hospitals and old people's homes; the remaining 84% were living in private households. There is some evidence to suggest that it is the most disabled who were in institutions.

Among patients who were living in private households, we found that there were higher proportions of one and two person households than in the general population (13% and 50% respectively compared with 6% and 22% respectively). Conversely, there was a lower proportion of three or more person households (37% compared with 72%) (see table 7). This is partly due to the relatively high proportion of elderly persons among adult wheelchair patients; for we also found that among patients in private households the proportion living alone increased with age.

Because of the relatively large proportion of patients who were living alone in private households, it is not surprising to find that nearly a half (48%) of those in private households were classified as head of house-

**Table 7** Sizes of households of adult wheelchair patients compared with those of the general population†

Number of people in household	Patients in private households	General population of England and Wales
	%	%
One	13	6
Two	50	22
Three or more	37	72
	100	100
Average household size (persons)	2.5	2.8

† The figures for adult wheelchair patients are based on those living in private households only. The figures for the general population are based on people, of all ages, living in private households in England and Wales and are taken from the 1971 Census of Population.

**Table 8** Social class of adult wheelchair patients compared with the general population†

Social class of head of household or chief economic supporter	Patients in private households	General population of England and Wales
	%	%
Professional	3	5
Intermediate occupations	15	19
Skilled non-manual occupations	31	12
Skilled manual occupations	11	36
Semi-skilled occupations	16	17
Unskilled occupations	6	7
Other (housewives, students, etc.)	18	4
	100	100

† The figures for adult wheelchair patients are based on those living in private households only. The figures for the general population are based on people, of all ages, living in private households in England and Wales and are taken from the 1971 Census of Population.

hold<sup>1</sup>. However, it is worth mentioning that even among three or more person households a substantial proportion (29%) of patients were head of household.

In table 8 we compare the social class of the heads of households of adult wheelchair patients who were living in private households with the social class of the chief economic supporters<sup>2</sup> of the households of the

<sup>1</sup> The head of household is defined as that person who is both a member of the household and either the person or the husband of the person who owns or is responsible for the household accommodation.

<sup>2</sup> The definition of chief economic supporter is different from that of head of household, but in most cases the head of household will also be the chief economic supporter.

general population. It is noteworthy that adult wheelchair patients who were living in private households tended to belong to households of a lower social class than did members of the general population; one reason may be that a relatively high proportion (48%) of patients who were living in private households were also heads of households, for we shall see in the following sub-section that very few patients had jobs.

Table 9 Full-time and part-time employment of adult wheelchair patients compared with the general population†

Age in years	Proportion employed					
	Males		Females		Males and females	
	%	%	%	%	%	%
18 - 29	21	81	20	49	20	72
30 - 39	22	90	19	52	45	71
40 - 49	37	91	2	57	17	77
50 - 59	19	89	8	51	10	72
60 - 64	16	86	-	27	6	51
65 - 69	-	30	-	12	-	20
70 and over	-	11	-	3	-	6
All ages	12	77	2	39	5	59
Retirement age*						
Below retirement age	22	87	6	51	14	72
Above retirement age	-	19	-	12	-	14

† The percentages shown in italics relate to the population of England and Wales aged 18 years and over taken from the 1971 Census of Population.

\* Retirement age was taken to be 65 years for men and 60 years for women.

## Employment

Because nearly two-thirds of adult wheelchair patients were above retirement age, we would expect to find that only a small proportion (5%) were in paid employment; they consisted of 4% who worked full-time, that is over 30 hours a week, and 1% who worked only part-time, that is over 10 hours a week and up to and including 30 hours a week. Those not in paid employment were made up of 3% who were unemployed or sick but actively seeking work and 92% who were not working and had no intention of obtaining a job.

Furthermore, we note that for all age-groups and for both sexes the employment rate for adult wheelchair patients was much lower than that for the general population (see table 9). Hence, for those below retirement age, members of the general population were more than five times as likely to be in employment than were wheelchair patients (72% compared with 14%). Clearly wheelchair patients have difficulty in obtaining jobs.

## 3.2 Disabilities and their effects

### Patients' disabilities

As mentioned earlier, instead of asking patients about their disabilities, we obtained details of their disabilities from files kept at the Appliance Centres. In most cases these files contained prescription forms (usually completed by a doctor) which had an adequate

description of a patient's disability. However, some of the entries on these prescription forms inadequately described the disability, causing difficulties of classification, while in a small number of cases there was no entry at all. In a few cases information from a patient's prescription form was supplemented by information collected during the interview.

Table 10 gives, under eight broad headings, details of the disabilities suffered by our interviewed sample of adult wheelchair patients aged 18 years and over. A similar table for wheelchair patients of all ages can be found in Appendix A.

Table 10 Disability diagnosed when wheelchair was prescribed

	%
<b>Arthritis and related conditions</b>	
Osteoarthritis	12
Rheumatoid arthritis	12
Arthritis (type not given)	4
Cervical spondylosis	1
Ankylosing spondylosis	*
	29
<b>Cerebro-vascular diseases</b>	
Hemiplegia or hemiparesis	13
Cardiac diseases	4
Cerebro-vascular accident (outcome unspecified)	1
	18
<b>Organic nervous diseases and resulting effects</b>	
Multiple sclerosis	13
Other organic nervous diseases	3
	16
<b>Amputations</b>	
Double above knee	1
Double below knee	*
Single above knee	3
Single below knee	1
Single arm	1
Others	2
	7
<b>Paraplegia and tetraplegia</b>	
Paraplegia (traumatic)	4
Quadriplegia or tetraplegia (traumatic)	2
Monoplegia	*
Triplesia	*
	6
<b>Cerebral palsy</b>	
	6
<b>Poliomyelitis and resulting effects</b>	
	4
<b>Other disabilities</b>	
Trauma of any cause not mentioned elsewhere	2
Parkinson's disease	2
Muscular dystrophy	1
Bone disease	1
Peripheral vascular disease (without amputations)	1
Spina bifida	1
Friedreich's ataxia	1
Respiratory disease	1
Senility	*
Psychiatric disorders	*
Others	4
	13
<b>Disability not recorded</b>	
	2
<b>Base - adult wheelchair patients</b>	
	978

Note: the percentages add to slightly more than 100 because a few patients had more than one disability.



Table 11 Disability analysed by sex and age of patient

Disability	Sex		Age								All patients
	Male	Female	18-29	30-39	40-49	50-59	60-69	70-79	80 & over		
	%	%	%	%	%	%	%	%	%	%	
Arthritis and related conditions	14	37	-	10	16	20	28	35	50	29	
Cerebro-vascular disease	20	18	2	4	9	10	26	24	20	18	
Organic nervous diseases and resulting effects	17	15	7	17	38	35	17	9	1	16	
Amputations	11	5	-	-	1	4	5	12	12	7	
Paraplegia and tetraplegia	9	4	5	32	9	4	5	2	3	6	
Cerebral palsy	10	4	44	17	5	8	3	1	-	6	
Poliomyelitis and resulting effects	4	3	5	6	9	5	5	2	1	4	
Other	14	13	33	10	9	14	10	14	14	13	
Not known	1	2	4	4	4	-	1	1	1	2	
Base - adult wheelchair patients	339	639	59	47	81	130	236	255	167	978	

Note: the percentages add to slightly more than 100 because a few patients had more than one disability.

Because of the high mortality rate among those with congenital diseases or disabilities caused at birth, it is not surprising to find that these disabilities were more frequently found among the young than among the elderly; for example, there is a sharp fall, corresponding to a failure to survive, in the proportion of patients who had cerebral palsy (from 44% among those who were 18 to 29 years of age to only 1% among the 70 year olds and over). On the other hand some disabilities progress with age; in particular, the proportion who suffered from arthritis increases from less than one in twenty among patients who were less than 40 years of age to a half among patients who were 80 years old or over (see table 11).

### Effects on limbs, back and neck

Early in the interview, we asked patients a series of questions related to mobility; these concerned the ability to use their limbs, to walk short distances, and to perform certain basic activities. They serve to give a picture of the limitations imposed on our wheelchair patients.

We began by asking patients what use they had in their limbs and joints; for each limb and joint they were asked whether they had complete use, limited use or no use. Table 12 shows that legs were the limbs most affected by patients' disabilities; only 6% of patients had full use in both legs and only a further 13% had full use in one leg but not the other. Nearly a quarter (24%) had no use in either leg. In many cases knees and hips

Table 12 Limitations in the use of legs, knees, hips, arms and hands

Limitation of use	Legs	Knees	Hips	Arms	Hands
	%	%	%	%	%
Complete use in both	6	9	29	27	41
Limited use in one, limited use in other	7	8	5	5	6
Complete use in one, no use in other	5	8	1	8	5
Limited use in both	49	42	38	35	35
Limited use in one, no use in other	9	10	9	12	10
No use in either	24	23	18	13	3
Base (=100%)	978	978	978	978	978
- adult wheelchair patients					

were also affected, knees to almost the same extent as legs but hips to a rather lesser extent.

We found that arms were rather less affected than legs. Nonetheless, only 27% of patients had full use of both arms, and only another 13% had full use in one arm but not the other. A higher proportion (41%) had full use in both hands. These findings suggest that a substantial proportion of patients will be unable to propel a wheelchair using their hands and arms.

Further analysis showed that 6% of patients had no use in any of their arms or legs.

We also asked patients whether they could bend their backs or move their necks; for each movement we asked whether this could be done easily, with difficulty or not at all. Patients were rather more likely to have difficulty with bending their backs than with moving their necks; only 40% said they could bend their backs easily compared with nearly three-quarters (72%) who said they could move their necks easily. Most of those who could not bend their backs easily or move their necks easily could do so with difficulty; hence, very few patients had no movement at all in their backs (7%) or in their necks (2%).

Table 13 Limitations in the use of back and neck

Limitation of use	Back	Neck
	%	%
Could move - easily	40	72
with difficulty	53	26
not at all	7	2
Base (=100%)	978	978
- adult wheelchair patients		

### Ability to walk

We have already mentioned that nearly a quarter (24%) of patients had no use in either leg and that very few (6%) had full use in both. This, of course, affects their ability to walk. In order to find out whether or not our patients did any walking either indoors or outdoors,

Table 14 Ability to walk short distances analysed by disability

Disability	Walk short distances indoors			Walk short distances outdoors			Base (100%)
	Without aid	Only with aid	Not at all	Without aid	Only with aid	Not at all	
Arthritis and related conditions	% 12	66	22	3	34	63	248
Cerebro-vascular disease	% 16	63	21	3	37	60	180
Organic nervous diseases and resulting effects	% 4	48	48	1	25	74	154
Amputations	% 16	44	40	7	33	60	67
Paraplegia and tetraplegia	% 6	37	56	2	23	75	54
Cerebral palsy	% 13	37	50	8	30	62	60
Poliomyelitis and resulting effects	% 11	40	49	6	37	57	36
Other disabilities	% 25	50	25	6	36	58	185
All disabilities	% 13	54	33	4	33	63	978

we asked them whether they walked short distances either unaided or with the help of somebody or some walking aid to lean on. A short distance was defined as the length of an average size room. We found that a third (33%) never walked short distances **indoors** and just under two-thirds (63%) never walked short distances **outdoors**. Only a small proportion walked short distances unaided indoors (13%) or outdoors (4%).

Table 14 shows how the ability to walk is related to type of disability.

#### Difficulties with basic activities

We also asked patients about the help they needed with six basic activities; getting in and out of bed, dressing and undressing, getting onto and using the WC, washing their hands and face, having a bath or all over wash, and eating. For each activity we asked whether they always needed help, only sometimes needed help or could always do it unaided. Table 15 shows that for each activity at least a quarter of patients needed help. Activities causing particular difficulty were getting onto and using the WC and having a bath or all over wash (89% and 83% respectively of patients needed at least some help with these activities).

Table 15 Proportion needing help for certain basic activities

Activity	Always needed help	Sometimes needed help	Always unaided	Base (100%)
Getting in and out of bed	% 48	13	39	978
Dressing and undressing	% 50	14	36	978
Getting onto and using the WC	% 39	50	11	978
Washing your hands and face	% 25	9	66	978
Having a bath or all over wash	% 77	6	17	978
Eating	% 18	11	71	978

### 3.3 Anthropometric measurements

Since designers of wheelchairs need anthropometric measurements of the potential occupants and such measurements are not available we arranged for our interviewers to make them. The number of measurements that could be taken during the interview had to be limited because of the amount of time required. So, on the advice of ergonomists with some knowledge of wheelchair design, we settled on 14 measurements which could be fairly easily taken during the interview.

Each interviewer was given a pair of wooden one-foot rulers with notches cut so that a steel rule could rest in the notches to form a crude pair of callipers. Although this equipment lacked the sophistication of a purpose-built instrument, it was adequate for the level of accuracy required. Measurements were made in inches to the nearest eighth of an inch. For each patient an attempt was made to secure measurements 1 to 14 as shown in Figure 1. From some of these measurements it was possible to derive other useful measurements.

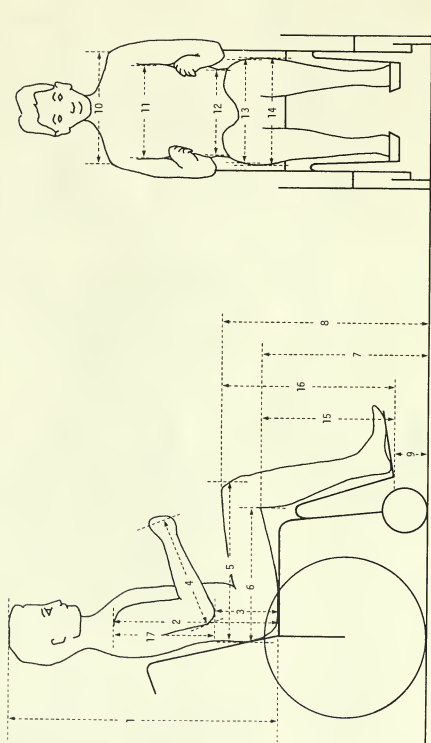
A great deal of effort was put into training the interviewers and detailed instructions were provided on how each of the fourteen measurements was to be taken. A practical demonstration was arranged and this was followed by a session during which the interviewers practised measuring volunteers sitting in wheelchairs.

All measurements were taken with the patients sitting as upright as possible in the wheelchair without being uncomfortable. Patients with more than one wheelchair were asked to sit in the one they used the most. In general the measurements were taken of the patient's right-hand side, but, where limbs were very deformed or amputated, measurements were taken of the left-hand side. Occasionally with obese patients or those wearing very thick clothing there were difficulties in locating the measurement points.

The majority of wheelchair patients (83%) were measured by the interviewer. Most of the 17% of cases where measurements were not taken, occurred because it was not convenient at the time of interview; few because the patients did not wish to be measured. Of the wheelchair patients who were measured 25% had deformities, other than amputations, which affected some of the measurements. The nature of these deformities can be seen in table 16.

Tables 17-20 show the distribution of all 17 measurements. Distributions are given both in centimetres and in inches. Figure 1 defines the measurements. As we have already said, our main purpose in making these measurements was to provide data for wheelchair designers in the future. Anyone wishing to relate these measurements of the patients to the dimensions of the

Figure 1 Measurements taken and derived



KEY:

Measurements taken:

1. Seat to head
2. Seat to shoulder
3. Seat to elbow
4. Elbow to knuckles
5. Buttocks to kneecap
6. Buttocks to underside of knee
7. Ground to underside of knee

Measurements derived:

15. Footrest to underside of knee
16. Footrest to kneecap
17. Elbow to shoulder

Table 16 Deformities affecting measurements

Deformities	%
Bent spine or slumped in seat	11
Deformed knees, legs, or feet	8
Deformed arms, elbows, or hands	4
Obesity	2
Head in unnatural position	1
Other deformities	4
None	75
Base - patients measured	814

Note: the percentages add to slightly more than 100 because a few patients had more than one deformity.

existing range of wheelchairs will find the wheelchair dimensions given in Appendix D. We shall make some use of patients' measurements in later sections of the report where we relate them to criticisms of the chairs.

Height and weight were not measured during the interview because of the practical difficulties. Instead we took this information from the patient's file kept at the Appliance Centre. Hence, although we give tables of height and weight in Appendix B, these items are not, strictly speaking, comparable with the other measurements since they had been recorded at an earlier date when the wheelchair was prescribed.

Table 17 Patients' measurements in centimetres

Measurements (see Figure 1) with patient wearing indoor clothing and sitting in wheelchair								
Distribution (in centimetres)	Measurements taken						Derived	
	1	2	5	6	7	8	15	16
Less than 24	-	1	1	-	-	-	19	7
24 - 25	-	-	-	-	-	-	8	-
26 - 27	-	1	-	1	1	-	17	2
28 - 29	-	-	-	-	-	-	14	2
30 - 31	-	2	-	-	-	1	37	3
32 - 33	-	4	-	3	-	-	61	3
34 - 35	-	7	1	2	3	-	90	12
36 - 37	-	5	-	3	4	-	104	10
38 - 39	-	16	2	11	16	-	139	16
40 - 41	-	21	2	42	34	-	127	39
42 - 43	-	22	5	68	49	1	70	29
44 - 45	-	65	4	122	62	4	50	67
46 - 47	1	75	18	128	91	11	24	83
48 - 49	1	109	27	129	121	15	16	120
50 - 51	2	101	57	99	102	23	10	119
52 - 53	7	129	110	86	132	56	5	140
54 - 55	6	94	107	39	71	56	-	69
56 - 57	8	46	105	22	50	61	1	32
58 - 59	10	49	115	17	31	74	-	22
60 - 61	9	38	98	6	13	111	-	13
62 - 63	23	14	67	5	15	99	1	4
64 - 65	33	3	28	1	2	99	1	-
66 - 67	66	9	23	3	1	87	-	-
68 - 69	83	-	10	-	-	50	-	1
70 - 71	84	1	4	-	-	25	-	-
72 - 73	110	1	3	-	-	12	-	-
74 - 75	77	-	3	-	-	3	-	-
76 - 77	94	-	2	-	-	1	-	-
78 - 79	58	-	-	-	-	1	-	-
80 - 81	68	-	1	-	1	-	-	-
82 - 83	26	-	-	-	-	-	-	-
84 - 85	15	-	-	-	-	-	-	-
86 and over	33	-	-	-	-	-	-	-
Total	814	813	793	787	789	790	794	793
Not measured	164	165	185	191	189	188	184	185
Lower quartile	68	47	53	45	46	56	34	46
Median	73	51	57	48	50	61	38	50
Upper quartile	76	55	60	52	53	65	41	53

Note: including those patients not measured, there were 978 patients in our sample.



Table 18 Patients' measurements in centimetres

Measurements (see Figure 1) with patient wearing indoor clothing and sitting in wheelchair									
Distribution (in centimetres)	Measurements taken								Derived
	3	4	9	10	11	12	13	14	17
Less than 10	11	-	163	-	-	-	-	-	11
10	11	-	83	-	-	-	-	-	1
11	5	1	35	-	-	-	-	-	1
12	20	-	66	-	-	-	-	-	2
13	33	-	64	-	-	-	-	-	-
14	12	-	32	-	-	-	-	-	4
15	39	-	99	-	-	-	-	-	5
16	28	1	55	-	-	-	-	1	10
17	56	-	44	-	-	-	-	1	4
18	35	-	22	-	-	-	-	1	10
19	56	1	17	-	-	1	-	1	10
20	99	-	19	-	-	1	-	3	10
21	46	1	4	-	1	1	1	-	13
22	81	1	4	-	2	-	2	1	26
23	33	-	-	-	7	4	-	1	20
24	55	3	-	-	13	19	-	11	22
25	54	9	-	1	28	23	1	7	32
26	31	9	-	1	34	42	9	17	48
27	29	25	1	6	56	69	15	34	59
28	13	12	-	6	38	34	6	22	42
29	13	44	-	6	64	68	9	28	59
30	11	74	-	12	62	89	17	42	62
31	10	102	-	25	92	83	19	47	70
32	5	62	-	14	44	43	27	39	43
33	9	142	1	63	120	89	74	95	74
34	3	61	-	38	55	49	49	80	47
35	-	85	-	76	61	59	85	76	27
36	3	66	-	73	39	34	80	52	23
37	3	25	-	45	15	16	40	31	21
38	-	49	1	90	24	32	98	56	29
39	-	17	-	43	16	11	56	42	18
40	1	15	1	80	16	16	76	51	10
41	-	2	-	61	9	10	44	18	5
42	-	-	-	35	3	4	18	10	1
43	1	1	-	49	9	3	34	13	-
44	1	-	-	20	-	4	16	6	1
45	-	1	-	30	2	2	13	5	-
46	1	-	1	13	1	2	6	3	-
47 and over	3	2	-	25	1	3	8	10	-
Total	811	811	712	812	812	811	803	803	811
Not measured	167	167	266	166	166	167	175	175	167
Lower quartile	17	31	10	35	29	29	34	31	26
Median	21	33	13	38	32	31	37	34	30
Upper quartile	24	35	16	41	34	615	40	38	33

Note: including those patients not measured, there were 978 patients in our sample.

Table 19 Patients' measurements in inches

Measurements (see Figure 1) with patient wearing indoor clothing and sitting in wheelchair								
Distribution (in inches)	Measurements taken						Derived	
	1	2	5	6	7	8	15	16
Less than 10	-	1	1	-	-	-	21	7
10	-	1	-	1	1	-	20	2
11	-	-	-	-	-	-	30	3
12	-	5	-	1	-	1	55	4
13	-	7	1	4	3	-	109	11
14	-	10	-	9	8	-	156	16
15	-	19	2	17	24	-	156	29
16	-	28	4	70	49	-	112	41
17	-	73	7	150	84	5	77	77
18	1	107	20	171	137	14	30	116
19	2	140	56	154	138	28	16	165
20	5	132	107	93	141	52	9	159
21	9	129	136	63	101	67	-	91
22	13	70	160	28	67	85	1	44
23	10	54	126	17	23	122	-	17
24	25	23	94	5	8	125	-	9
25	54	7	43	2	4	146	2	1
26	79	5	18	2	-	71	-	1
27	110	-	8	-	-	47	-	-
28	132	2	4	-	-	20	-	-
29	121	-	5	-	-	6	-	-
30	98	-	-	-	-	1	-	-
31	72	-	1	-	-	-	-	-
32	35	-	-	-	1	-	-	-
33	25	-	-	-	-	-	-	-
34 and over	23	-	-	-	-	-	-	-
Total	814	813	793	787	789	790	794	793
Not measured	164	165	185	191	189	188	184	185
Lower quartile	27	18	21	17	18	22	13	18
Median	28	20	22	18	19	24	15	19
Upper quartile	30	21	23	20	21	25	16	20

Note: including those patients not measured, there were 978 patients in our sample.

Table 20 Patients' measurements in inches

Measurements (see Figure 1) with patient wearing indoor clothing and sitting in wheelchair									
Distribution (in inches)	Measurements taken								Derived
	3	4	9	10	11	12	13	14	
Less than 4	20	-	225	-	-	-	-	-	17
4	7	1	51	-	-	-	-	-	11
4½	20	-	71	-	-	-	-	-	1
5	33	-	64	-	-	-	-	-	2
5½	39	-	88	-	-	-	-	-	1
6	36	1	91	-	-	-	-	-	1
6½	60	-	51	-	-	-	-	-	6
7	65	-	29	-	-	-	-	-	6
7½	86	1	24	-	-	2	-	3	11
8	83	1	8	-	1	1	1	-	15
8½	83	1	5	-	2	3	2	1	16
9	71	1	-	-	12	11	-	9	37
9½	66	8	-	1	33	28	-	10	28
10	33	9	-	1	32	42	10	14	49
10½	32	28	1	6	61	73	15	37	56
11	24	34	-	9	69	73	9	43	70
11½	12	74	-	12	88	104	19	41	68
12	11	124	-	28	99	97	23	55	84
12½	10	135	1	34	111	101	70	81	82
13	6	113	-	62	82	61	56	98	74
13½	1	97	-	77	74	72	94	99	52
14	3	81	-	91	52	40	95	64	35
14½	3	56	1	98	31	41	110	61	31
15	-	35	-	72	22	17	76	62	18
15½	1	14	1	77	15	17	73	50	18
16	-	3	-	72	12	10	55	25	10
16½	-	1	-	64	10	6	44	20	4
17	2	-	-	38	2	4	22	9	5
17½	-	1	-	32	2	3	15	5	3
18	1	-	1	13	1	2	6	3	1
18½ and over	3	2	-	25	1	3	8	10	5
Total	811	811	712	812	812	811	803	803	811
Not measured	167	167	266	166	166	167	175	175	167
Lower quartile	6½	12	4	13½	11	11	13	12	10½
Median	8	12½	5	14½	12½	12	14½	13½	12
Upper quartile	9½	13½	6	16	13½	13½	15½	14½	13

Note: including those patients not measured, there were 978 patients in our sample.

## 4 Wheelchairs and their use

### Introduction

We begin this section by looking at the number of wheelchairs on issue to patients of all ages, based on an analysis of patients' files at the Appliance Centres. We then consider the number of wheelchairs kept by adult wheelchair patients only, based on the chairs they claimed to have when interviewed. This is followed by an analysis of the amount of use made of wheelchairs, both in terms of the number of hours a patient sits in wheelchairs and of the number of hours a particular wheelchair is said to be used.

### 4.1 Number of wheelchairs on issue

#### Wheelchairs on issue to patients of all ages

As mentioned in Section 3.1 we estimated that in June 1973 the Department of Health and Social Security had a total of about 137,000 powered and non-powered wheelchairs<sup>1</sup> on permanent loan to 113,000 patients. Because very few patients had three or more chairs, this means that about one in five patients had two.

Table 21, which is based on an analysis of patients' files, gives the number of powered and non-powered wheelchairs on issue per 1,000 wheelchair patients of all ages; it shows that there were 1,225 wheelchairs on issue for every 1,000 patients. Surprisingly, although the prescription rate for wheelchairs among the general population was lower for men than for women (see table 3), the number of chairs on issue per 1,000 patients was higher for men than for women (1,262 chairs per 1,000 males compared with 1,212 chairs per 1,000 females). The reason why male patients had more chairs than female patients is not clear; however, it may have been due to a larger proportion of men having jobs, for we also found that, among adult wheelchair patients, the proportion with more than one wheelchair was much higher among those who were in full-time or part-time employment than among those who were not (47% compared with 18%).

Comparison of the different age-groups shows that, for all age-groups apart from those under twenty years of age, the number of wheelchairs on issue per 1,000 patients is inversely related to age; thus, the number of chairs decreased from 1,438 per 1,000 patients in the 20 to 29 years old age-group to 1,047 per 1,000 patients among the 80 years old and over age-group. Again, differences in employment rates may provide some explanation; in particular this would explain the reason

<sup>1</sup> This figure includes 5,000 powered wheelchairs.

for the drop in the number of chairs among the two youngest age-groups. However, it is also possible that elderly patients are least likely to be given more than one wheelchair because they tend to be less active than younger patients.

Table 21 also shows the variation with disability in the number of wheelchairs on issue per 1,000 patients; in particular, it shows that those most likely to have more than one chair were patients who suffered from poliomyelitis, paraplegia or tetraplegia and patients with cerebral palsy.

Table 21 Number of wheelchairs on issue per 1,000 patients analysed by sex, age and disability of patient

Sex	Number of chairs per 1,000 patients			Number powered per 1,000 chairs
	Non-powered	Powered	All chairs	
Male	1213	50	1262	39
Female	1160	42	1212	34
Age in years				
Up to 9	1417	-	1417	-
10 - 19	1318	39	1357	29
20 - 29	1379	59	1438	40
30 - 39	1312	75	1388	54
40 - 49	1298	53	1351	39
50 - 59	1204	66	1270	52
60 - 69	1124	63	1187	53
70 - 79	1101	44	1145	38
80 and over	1025	22	1047	21
Disability				
Amputations	1190	7	1197	6
Arthritis and related conditions	1083	43	1126	38
Paraplegia and tetraplegia	1458	21	1479	14
Poliomyelitis and resulting effects	1465	42	1507	28
Organic nervous diseases	1191	93	1284	72
Cerebro-vascular disease	1037	50	1087	46
Cerebral palsy	1432	33	1464	22
Congenital disorders	1235	153	1388	-
Miscellaneous	1074	46	1120	41
All wheelchair patients	1181	44	1225	36

Note: based on an analysis of the files of 1,955 wheelchair patients of all ages

#### Wheelchairs on issue to adult wheelchair patients

Besides extracting data from patients' files about the number of wheelchairs on issue we also asked during the course of the interview about the number of wheelchairs which a patient had, including powered chairs and ones obtained privately. The answers to this question confirmed that about four out of five adult wheelchair patients had only one wheelchair; the 19%

who claimed to have more than one were made up of 17% who said they had two chairs and 2% who said they had three chairs. None of the patients in our sample claimed to have more than three wheelchairs. In some cases we found that, as well as having a non-powered NHS wheelchair, a patient also had either a powered NHS chair or a chair obtained from a source outside the National Health Service. Thus, among the 19% who claimed to have more than one wheelchair, 5% said they had powered chairs and 5% said they had chairs obtained privately. In terms of wheelchairs, 5% were powered and 4% were obtained privately.

#### **Non-NHS wheelchairs**

The 4% of wheelchairs which were obtained from outside the National Health Service consisted of 3% which were bought privately and 1% which were obtained from a charitable organisation. We asked the small group of patients involved why they had not obtained these chairs through the National Health Service. In the majority of cases the reason given did not imply a criticism of NHS wheelchairs. Only in about a third of cases did the reasons imply such a criticism. Most of this group said an NHS chair would have been unsuitable but a few just said that a private chair was better. In addition, a small number of patients, while not criticizing NHS wheelchairs, were critical of the length of time they thought they would have to wait for an NHS chair. As we shall see later, there are sometimes considerable delays in supplying NHS chairs. Within the group who gave reasons which were not critical of either NHS wheelchairs or the service, there were some who had obtained chairs privately because they had either not known that the NHS supplied wheelchairs or had known about NHS chairs but did not think that they were eligible for one. One is left wondering how many people there are, not covered by this survey, who are unaware that they may be eligible for an NHS wheelchair.

#### **4.2 Amount used**

##### **Introduction**

The amount of wear and tear on a wheelchair depends, of course, on how often and in what ways it is used. Because of this, we included in our questionnaire some questions on the amount of use made of wheelchairs and on the occasions on which wheelchairs were used. This section looks at the amount used.

##### **Collecting data on amount used.**

Wheelchair usage in terms of the number of hours a week can be looked at in terms of patients or wheelchairs. There is a difference because, as we have already seen, 19% of adult wheelchair patients had more than one chair.

All our questions on frequency of use referred to use at about the time of interview. Because we were interviewing patients during the months of November and

December this meant that our data would not be typical of other times of the year since use may change considerably between summer and winter, particularly in the case of outdoor use.

We began by asking, for each wheelchair separately, about the number of days a week the chair was used; patients were asked to distinguish between indoor and outdoor use since the pattern of use would obviously vary between the two occasions. We then asked, separately for Saturday, Sunday and weekdays, for the number of hours patients normally used their wheelchairs on these days. From the data we were then able to calculate the number of hours a week each wheelchair was used and, for patients with more than one chair, the total hours spent in a chair. Because a fifth of patients have more than one chair it is important to distinguish tables based on patients from those based on wheelchairs. Before looking at hours of use, we will deal with patients who have wheelchairs on issue but who no longer use one at all.

##### **Non-use**

We found that 6% of patients could be classified as non-users because they had not used a wheelchair for at least six months prior to the interview and were not expecting to use one in the future. In terms of wheelchairs the proportion not used was higher (10%). This was because as many as 31% of patients with more than one wheelchair only used one of them.

Over a half of non-users were patients whose condition had either worsened (39%) or improved (16%) to such an extent that a wheelchair was not needed. Only a small proportion (about a fifth) could be attributed to faults in the wheelchair. Among this small group were chairs said to be too large for indoor use, too heavy or very uncomfortable. In other cases patients could not propel themselves and had nobody to push them. A few chairs were kept for emergencies only.

In terms of wheelchairs, about half the unused wheelchairs were with patients who had two chairs but who found their other wheelchair more suitable to their needs. This group contained a few cases where an NHS chair had been replaced by a private chair, but there were a similar number of cases where a private wheelchair had been replaced by an NHS one. A substantial part of the remaining 5% of wheelchairs which were unused were with patients whose condition had either worsened or improved to such an extent that a wheelchair was not needed.

The extent and nature of non-use raises the question of whether any means can be found of retrieving unused NHS wheelchairs and whether this would be worth while.

##### **Wheelchairs temporarily out of use**

As well as finding the 6% of patients classified as non-users because they had not used their wheelchairs for at least six months and did not expect to use them

we found a further 6% were temporary non-users whose wheelchairs were not in use but were expected to be used sometime in the future. In terms of wheelchairs, 8% were classified as being temporarily out of use. Over three-quarters of these chairs were designed for outdoor use but were only used either during the summer or in fine weather during the winter. The remainder included some chairs which were not in use because patients had temporarily deteriorated to such an extent that they were bedridden. There were also a few cases where nobody was available to push the wheelchair for the patient.

#### Amount used

We have already mentioned that the number of hours a week a wheelchair is used can be given both in terms of patients and of wheelchairs. In this report most of the analysis on amount of use is given in terms of patients, but we do give one table, based on wheelchairs, which shows how use varied between different model types. However, we begin by looking at the number of hours a week spent in a wheelchair by

wheelchair users: permanent non-users are excluded from the analyses that follow. Table 22 gives the number of hours per week spent in wheelchairs indoors and outdoors. If we compare indoor and outdoor use we find that a greater proportion of patients used a wheelchair outdoors than used a wheelchair indoors (74% compared with 58%). Despite this, the majority of wheelchair usage, in terms of number of hours a week, took place indoors; thus, on average, a patient spent 32.0 hours a week in a wheelchair indoors and 4.4 hours a week in a wheelchair outdoors, giving a total average usage of 36.4 hours a week. Further analysis showed that there was no close relationship between indoor and outdoor use; in particular, heavy users of wheelchairs indoors were not necessarily also heavy users of wheelchairs outdoors.

Comparing the sexes we find that, on average, men used their wheelchairs more frequently than women (42.1 hours per week compared with 33.6 hours per week). We can see, however, from table 23 that this difference may be accounted for by the fact that the men were on average younger than the women, for

Table 22 Total number of hours a week a patient spends in a wheelchair indoors and outdoors (November/December)

Total number of hours per week a patient spends in a wheelchair indoors/outdoors	Indoors	Outdoors	Both
Patient does not use chair, but expects to do so in future	% 6	% 6	% 6
Patient uses chair outdoors/indoors only	36	19	-
Uses less than once a week	2	16	9
Up to and including 2 hours		11	
Over 2 hours, up to and including 4 hours		13	
Over 4 hours, up to and including 6 hours	-10	9	-28
Over 6 hours, up to and including 8 hours		4	
Over 8 hours, up to and including 10 hours		4	
Over 10 hours, up to and including 30 hours	6		12
Over 30 hours, up to and including 50 hours	6	-10	6
Over 50 hours, up to and including 70 hours	10		8
Over 70 hours, up to and including 90 hours	10		8
Over 90 hours	11		12
Chair is used indoors/outdoors, but number of hours not known	3	8	11
Average number of hours indoors/outdoors	Hours 32.0	Hours 4.4	Hours 36.4
Base - adult wheelchair users (= 100%)	921	921	921

Table 23 Total number of hours a week a patient spends in a wheelchair indoors and outdoors (November/December) analysed by sex and age of patient

Total number of hours per week a patient spends in a wheelchair indoors/outdoors	Sex		Age							
	Male	Female	18-29	30-39	40-49	50-59	60-69	70-79	80 & over	
	%	%	%	%	%	%	%	%	%	
Patient does not use chair, but expects to do so in future	4	8	2	-	1	6	6	7	15	
Uses less than once a week	10	9	3	2	19	4	10	8	12	
Up to and including 10 hours	22	32	14	11	20	27	32	34	30	
Over 10 hours, up to and including 30 hours	13	12	13	9	7	12	14	14	10	
Over 30 hours, up to and including 50 hours	7	5	10	2	4	4	6	6	8	
Over 50 hours, up to and including 70 hours	8	7	17	5	8	7	7	8	9	
Over 70 hours, up to and including 90 hours	11	7	13	11	13	11	6	8	3	
Over 90 hours	14	4	17	27	19	16	11	8	5	
Chair is used, but number of hours unknown	11	11	11	27	12	12	8	7	8	
Average number of hours per week indoors	Hours 36.0	Hours 30.1	Hours 41.2	Hours 55.5	Hours 37.4	Hours 40.5	Hours 29.9	Hours 28.0	Hours 21.8	
Average number of hours per week outdoors	6.1	3.5	8.5	8.8	6.8	5.2	4.1	3.2	2.0	
Average number of hours per week for both	42.1	33.6	49.7	64.3	44.2	45.7	34.0	31.2	23.8	
Base - adult wheelchair users (=100%)	319	602	58	43	78	120	225	237	160	



Table 24 Total number of hours a week a patient spends in a wheelchair indoors and outdoors (November/December) analysed by disability of patient

Total number of hours per week a patient spends in a wheelchair indoors/outdoors	Amputations	Arthritis	Paraplegia & tetraplegia	Polio	Organic nervous diseases	Cerebro-vascular diseases	Cerebral palsy	Misc
	%	%	%	%	%	%	%	%
Patient does not use chair, but expects to do so in future	1	12	2	3	1	11	7	4
Uses less than once a week	4	12	7	12	8	10	2	4
Up to and including 10 hours	14	33	6	16	21	38	26	37
Over 10 hours, up to and including 30 hours	14	11	-	7	12	14	10	13
Over 30 hours, up to and including 50 hours	8	5	10	34	6	5	8	9
Over 50 hours, up to and including 70 hours	17	6	17	4	11	4	15	8
Over 70 hours, up to and including 90 hours	9	8	6	7	13	4	12	7
Over 90 hours	20	5	38	27	15	3	14	11
Chair is used, but number of hours unknown	8	8	14	21	13	10	8	6
Average number of hours per week indoors	46.1	21.9	60.2	41.9	42.4	14.7	36.0	25.1
Average number of hours per week outdoors	4.2	2.6	8.0	6.6	3.4	3.5	5.9	4.4
Average number of hours per week for both	50.3	24.5	68.2	48.5	45.8	18.2	41.9	29.5
Base - adult wheelchair users (=100%)	61	231	54	32	146	169	60	178

Table 25 Average number of hours a week a patient spends in a wheelchair (November/December) analysed by number of wheelchairs

Average number of hours per week a patient spends in wheelchair(s)	Number of wheelchairs	
	One	Two or more
	Hours	Hours
Indoors	25.5	52.7
Outdoors	3.4	6.4
Both	28.9	59.1
Base - adult wheelchair users	737	184

Table 26 Average number of hours a week a patient spends in a wheelchair (November/December) analysed by use in legs

Average number of hours a week spent in wheelchair(s)	Complete use in both legs	Complete use in one leg but not the other	Does not have complete use in either leg
	Hours	Hours	Hours
Indoors	14.0	20.5	35.1
Outdoors	3.1	4.5	4.4
Both	17.1	25.0	39.5
Base - adult wheelchair users	55	110	756

the average number of hours per week spent in wheelchairs decreases with age from 49.7 hours per week for patients who were in the youngest age-group to 23.8 hours per week for patients who were in the oldest age-group.

The differences in the average weekly use between the eight disability groups are shown in table 24. It is interesting to note that paraplegics and tetraplegics were the heaviest users of wheelchairs (68.2 hours a week on average), for we also found that they were

Table 27 Average number of hours a week a patient spends in a wheelchair (November/December) analysed by whether or not patient walks short distances

Whether walks short distances	Average number of hours a week spent in wheelchair(s)			
	Indoors	Outdoors	Total	Base (100%)
	Hours	Hours	Hours	
Walks short distances indoors without aid	7.4	3.8	11.2	126
Walks short distances indoors only with aid	16.3	4.7	21.0	532
Does not walk short distances indoors	45.6	2.0	47.5	320
Walks short distances outdoors without aid	14.3	5.1	19.4	35
Walks short distances outdoors only with aid	11.7	3.7	15.4	318
Does not walk short distances outdoors	36.9	2.4	39.3	625

one of the groups most likely to have more than one wheelchair. Additional analysis, given in table 25, shows that, despite the fact that as many as 31% of second wheelchairs were never used, adult wheelchair users with more than one chair spend over twice as much time in wheelchairs than do users with only one.

It would appear from the evidence that much of the variation in use is related to how severely a patient is disabled. For example, in table 26 we show how wheelchair usage is related to the amount of use a patient has in his or her legs. As would be expected, the more use patients had in their legs the less use they made of wheelchairs; thus, while the average weekly use among patients who had complete use in both legs was only 17.1 hours, it increased to 39.5 hours among

Table 28 Total number of hours per week wheelchair is used (November/December) analysed by model type

Total hours per week wheelchair is used	Model								All models
	8G	8GJ	8L	8BL	9	9L	13	Others	
	%	%	%	%	%	%	%	%	%
Wheelchair is not used but is expected to be used in the future	9	6	4	2	14	12	12	5	7
Used less than once a week	10	2	9	8	9	19	15	19	9
Up to and including 10 hours	23	18	26	28	38	37	43	23	28
Over 10 hours, up to and including 30 hours	6	16	12	16	9	11	6	12	11
Over 30 hours, up to and including 50 hours	8	4	9	5	2	-	3	8	6
Over 50 hours, up to and including 70 hours	8	18	6	8	2	1	3	8	7
Over 70 hours, up to and including 90 hours	12	9	7	10	1	1	-	7	7
Over 90 hours	9	9	9	9	2	3	-	11	8
Chair is used, but number of hours unknown	6	9	9	7	8	9	6	8	8
Average number of hours per week indoors	Hours 8.1	Hours 34.1	Hours 42.4	Hours 27.5	Hours 29.7	Hours 8.4	Hours 7.9	Hours 35.8	Hours 26.4
Average number of hours per week outdoors	2.6	2.4	4.1	3.4	3.7	3.5	2.6	4.5	3.6
Base (=100%)	161	50	238	156	135	62	30	144	976
- non-powered NHS wheelchairs in use									

patients who did not have complete use in either leg. Further analysis showed that average weekly use was even greater (65.1 hours) among patients who had no use at all in their legs.

It will be remembered that, in addition to asking patients about the use they had in their legs, we also asked them whether or not they walked short distances indoors and outdoors, either with or without aid. Table 27 shows, not surprisingly, that while average weekly use indoors was only 7.4 hours for patients who said they walked short distances indoors without aid, it was as high as 45.6 hours for patients who said they never walked short distances indoors, either aided or unaided. A similar variation can be observed for outdoor use.

There were also large differences in the average weekly use made of wheelchairs between patients who used walking aids and patients who did not; the average weekly use of the latter group (54.9 hours) exceeded that of the former group (20.0 hours) by 34.9 hours.

As may be expected, patients who were in full-time or part-time employment made more use of their wheelchairs than did patients who were not; thus, the average weekly use was 58.4 hours for patients with jobs compared with only 33.0 hours for patients without jobs. Furthermore, we found that over a quarter (28%) of patients in employment appeared to spend all their waking lives in their chairs for they said that on average they used wheelchairs for over 90 hours a week.

#### Differences between models

We mentioned earlier that because some patients had more than one chair, wheelchair usage can be looked at in terms of patients or chairs. Table 28 gives the

differences in the weekly use made of the seven main model types of wheelchair and is based on all NHS non-powered wheelchairs which were in use or were expected to be used in the future. The greatest differences are found between the model 8 series of self-propelling wheelchairs and the models 9, 9L and 13 pushchairs; self-propelling chairs were used, on average for 36.0 hours a week compared with an average of only 14.4 hours a week for pushchairs. These differences are accounted for by the fact that a higher proportion of self-propelling chairs were used indoors (63% compared with 33%), for we found earlier that in terms of hours per week the majority of use took place indoors.

#### 4.3 Occasions on which wheelchairs are used

We have already seen that the average user spends 36.4 hours a week in a wheelchair. Furthermore, we found that despite the fact that a greater proportion of patients used a wheelchair outdoors than indoors the majority of use, in terms of number of hours a week, took place indoors. Separate analyses for the different days of the week show that there is little difference between the weekend and the rest of the week. We now go on to briefly consider the occasions on which patients use wheelchairs.

It will be remembered that some 58% of patients<sup>1</sup> used a wheelchair indoors; we found that these patients included a small number (about 1%) who, although they sat in their wheelchairs indoors, never moved around in them. A higher proportion of patients (74%) used a wheelchair outdoors.

<sup>1</sup> Patients who were classified as permanent non-users are excluded from this analysis.



From table 29 we see that 25% of patients with either full-time or part-time jobs used a wheelchair for work.

A detailed analysis of the occasions on which wheelchairs are used outdoors is given in table 30. We will examine the problems wheelchair patients have on these occasions in section 9.

Table 29 Use of wheelchairs for work

Proportion of patients in full-time or part-time employment	5%
Proportion of working patients who use a wheelchair for work	25%
Average weekly use by patients who use a wheelchair for work	18.0 hours
<i>Base - adult wheelchair users</i>	921

Table 30 Occasions on which patients use wheelchairs outdoors

Proportion of patients who use a wheelchair outdoors	%
	74
Occasions used outdoors	
Visiting friends	58
Going to the shops	56
'Going for a walk'	28
Visiting theatres/cinemas	16
Day trips/outings in car	14
Looking around own garden	14
Visiting clubs	8
On holiday	6
Attending church	4
Attending sports meetings	3
Visiting doctor, dentist, etc.	3
Social occasions (not mentioned elsewhere)	3
Going out for a drink	2
Going to the hairdresser	2
For work	1
Other occasions	
<i>Base - adult wheelchair users</i>	921

Note: because some patients use their wheelchairs on more than one occasion outdoors, percentages add to more than 100.

## 5 Patients' views on their wheelchairs

### Introduction

It will be remembered that, as well as having non-powered NHS wheelchairs, about one in ten patients had powered chairs or ones obtained privately; in terms of wheelchairs, 5% were powered and 4% were obtained privately. Furthermore, we have also mentioned that about one in ten chairs could be classified as permanently not in use because they had not been used for at least six months prior to the interview and were not expected to be used in the future. We decided to exclude all unused wheelchairs, powered models and ones obtained privately from the following analyses, but the existence of these chairs should not be overlooked.

### 5.1 Overall satisfaction

During the course of the interview three general questions were asked about how satisfactory the wheelchair was. The first of these asked the patient to rate the chair as 'Very satisfactory', 'Satisfactory' or 'Not very satisfactory'. The second asked for the bad points of the wheelchair. The third asked whether anything could be done to make the wheelchair more suitable for someone with the same disability as the patient. The answers given to these three questions will now be considered for wheelchairs in use.

In answer to the rating question 49% of wheelchairs were considered very satisfactory, 42% satisfactory and only 9% not very satisfactory. There was very little variation in these proportions with either model type or the characteristics of the patient. Although in answer to this question most patients said that 'On the whole' they were very satisfied or satisfied with their wheelchairs, appreciable proportions were prepared to say in answer to the other two questions that the wheelchair had bad points (72%) or could be improved in some way (47%).

Thus in answer to the question about the bad points of the wheelchair only in 28% of cases was the patient unable to think of any bad points. The bad points fall about equally into two main categories, those concerned with comfort and those concerned with operating difficulties. Answers to such a general question present difficulties of classification but the most frequently mentioned bad points are shown in table 31.

Model 13 scored well as regards comfort. Model 8BL seemed responsible for more than the average amount of back discomfort.

Table 31 Most frequently mentioned bad points of wheelchairs

Bad points	Proportion of wheelchairs said to have this 'Bad point'
	%
Uncomfortable to sit in	12
Uncomfortable for back	6
Uncomfortable for feet	5
Rough ride due to castors	5
Loose swivel footrest	6
Difficult to steer	16
Difficult to push or handle	15
Difficult with kerbs	7
Inefficient brakes	7
<i>Base - non-powered NHS wheelchairs</i>	<i>1066</i>

*Note: patients often mentioned more than one bad point.*

Our third question asked patients what could be done to make their wheelchairs more suitable for people with similar disabilities to themselves. About half (46%) of wheelchairs were thought to be capable of improvement in some way. Again this proportion did not vary appreciably with the sex, age or disability of the patient.

Improvements suggested by patients seemed on the whole fairly practical. Some were ways of making the wheelchair more comfortable; patients felt that 7% of wheelchairs needed (more) cushions or padding, 3% needed a backrest extension, and 4% needed a backrest where the angle could be adjusted. Some suggestions concerned the dimensions of the wheelchairs; 4% were said to have seats of the wrong size and 2% of the wrong height. Further suggestions included the improvement of footrests (7%), replacement of castor wheels by fixed ones (3%), better brakes (2%) and better designs for armrests (2%). Other suggestions mentioned by a few patients included supplying straps, draught excluders, weather-proof covers, detachable trays and better tyres, reducing the weight of the wheelchair and improving its suspension. Instead of suggesting improvements to their present wheelchair, some patients wanted a completely different type of wheelchair. In 7% of cases patients felt that their non-powered wheelchair should be replaced by a powered one, in 2% that their pushchair should be replaced by a self-propelling type (in the majority of cases with one-arm propulsion) and in 2% that their wheelchair needed to be replaced by a more suitable model but did not mention a change in the type of propulsion.

Table 32 Aches and pains when sitting in the wheelchair analysed by model type

Whether suffers from aches and pains	Model								All models
	8G	8GJ	8L	8BL	9	9L	13	Others	
	%	%	%	%	%	%	%	%	%
Does not suffer	69	73	66	60	64	73	72	63	66
Does suffer	31	27	34	40	36	27	28	37	34
<i>Base - non-powered NHS wheelchairs in use (=100%)</i>									
	161	50	238	156	135	62	30	135	967
Location of aches and pains -									
Back	9	8	10	18	5	5	7	19	11
Legs	8	6	13	11	2	3	7	7	9
Buttocks	5	4	9	6	2	3	7	8	6
Lower back	1	-	5	6	7	2	3	2	4
Knees	2	-	3	4	4	5	7	2	3
Hips	4	2	4	2	5	2	3	1	3
Arms, hands	2	-	3	1	1	-	3	1	2
Stomach, chest	2	2	1	1	-	2	-	2	1
Other parts	3	6	3	3	3	4	3	4	2
All over	4	8	2	2	6	3	-	3	3
<i>Base - non-powered NHS wheelchairs in use</i>									
	161	50	238	156	135	62	30	135	967
Suggested ways of alleviating -									
Nothing can be done	14	11	15	16	20	12	18	21	17
NHS should provide -									
Seat cushions	5	4	7	4	4	4	3	3	5
Back cushions	2	2	3	6	4	1	3	5	4
Reclining backrests	2	-	2	4	-	1	-	2	2
Backrest extensions	1	4	2	4	-	-	-	2	2
Adjustable footrests	2	2	2	-	3	3	-	4	2
More rigid seat	2	-	2	1	1	1	3	-	2
Other suggestions	3	4	5	5	4	5	2	4	4
<i>Base - non-powered NHS wheelchairs in use</i>									
	161	50	238	156	135	62	30	135	967

Note: some patients mentioned more than one location or mode of alleviation.

With this general background to the level and nature of complaints we will now consider the answers to the more specific questions dealing with aspects of comfort and of operating the wheelchair.

## 5.2 Factors affecting comfort

### Extent of discomfort

Wheelchair patients frequently suffer from disabilities causing discomfort which no design of chair is likely to alleviate. Nonetheless, it seemed useful for comparative purposes to ask patients whether they had aches and pains when sitting in their wheelchairs, and where these pains occurred. Aches and pains were not experienced in 66% of wheelchairs. The 34% where such pains were experienced were equally divided between those where the patient felt nothing could be done and those where some suggestion was made that might improve matters. Table 32 gives greater details for a selection of models; Model 8BL seemed to be associated rather more with backache.

Not surprisingly, we found that discomfort, especially in the back and buttocks, increased with the amount of time spent sitting in the wheelchair (see table 33).

Table 33 Aches and pains when sitting in the wheelchair analysed by total number of hours per week wheelchair is used.

Whether suffers from aches and pains	Total number of hours per week chair is used			
	Less than once a week	Less than 30 hours	30-60 hours	60 hours or more
	%	%	%	%
Does not suffer	72	68	61	57
Does suffer	28	32	39	43
<i>Base (=100%) - non-powered NHS wheelchairs in use</i>				
	116	444	119	288
Proportion who suffer from aches and pains in -				
Back	%	%	%	%
Buttocks	1	10	17	16
	1	4	7	12
<i>Base - non-powered NHS wheelchairs in use</i>				
	116	444	119	288

### Sleeping in wheelchairs

We asked patients whether they could sleep in the wheelchairs. Only 32% of wheelchairs could be slept in. However, it is worth noting that the 68% which could not be slept in consisted of 52% where the patient did not wish to do so and only 16% where the patient wished to do so. All those who could not sleep in the

wheelchair were asked why this was the case. Very few of this group felt it was due to their disability. Just under a half (48%) said that the backrest was too low and 18% said the backrest was too upright. Further analysis shows that as many as 52% of wheelchairs with backrest extensions could be slept in. Thus, there may be a case for providing more backrest extensions.

### Cushions

It will be remembered that when patients were asked about the ways in which their wheelchair could be improved, 7% were said to need (more) cushions or padding. In addition, we have also mentioned that when patients were asked about what could be done to alleviate aches and pains when sitting in the chair 5% of chairs were said to need seat cushions and 4% to need back cushions. When patients were asked about the cushions they had, further evidence of an unmet need emerged (see table 34).

Table 34 Proportion of wheelchairs with seat, side and back cushions

	Type of cushion		
	Seat	Back	Side
No cushion	33	84	99
Cushion provided by -			
NHS	39	4	4
Otherwise	28	12	1
Base (=100%)	967	967	967

- non-powered NHS wheelchairs in use

As many as two-thirds (67%) of wheelchairs had seat cushions, although only about three-fifths of these cushions had been supplied by the NHS. In the case of back cushions 16% of wheelchairs had them but only a quarter had been supplied by the NHS. Side cushions were very rare; only 1% of wheelchairs had them and virtually none of these had been supplied by the NHS.

Very few of the cushions provided were not used. Thus cushions are much in demand but only about a half of those used are supplied by the NHS.

The small group using side cushions is of interest since virtually none had been provided by the NHS. Examination of this group suggests that side cushions are used not because the wheelchair is too wide but, it would seem, because the condition of the patient calls for extra support.

The majority of cushions were said to be comfortable, but about a sixth (16%) were said to be uncomfortable. The comfort of the cushion appears to depend to some extent on the material of the cover. Taking seat cushions, for example, where we have sufficient numbers for this analysis, 22% of the plastic-covered ones were said to be uncomfortable compared with 10% of the cotton-covered ones and 11% of the ones covered with man-made fibres such as nylon and rayon. The discomfort with the plastic-covered cushions was described in terms of being hot and clammy. Since the NHS cushions were mainly plastic-covered, a higher proportion of the NHS cushions (21%) were considered uncomfortable than were the non-NHS cushions (9%). Thus the evidence about cushions suggest that the wheelchair service might review its policy with regard to supplying them and possibly with regard to the material used for covering the cushions.

### Seat width

In designing hand-propelled wheelchairs the seat width is restricted by the need to provide room for the handrims and hands, for example, when passing through doorways. This can result in a seat which is too narrow for comfort.

In table 35, we give for the four series 8 hand-propelled models the numbers of wheelchairs with seats considered too wide or too narrow for comfort according to the hip width of the occupant measured when wearing

Table 35 Seat widths considered too wide or too narrow by hip width of patient and model of wheelchair

Hip width in inches (indoor clothes)	Model 8G			Model 8GJ			Model 8L			Model 8BL		
	Seat width 17" (Overall width 25")			Seat width 15" (Overall width 23")			Seat width 17" (Overall width 24 1/2")			Seat width 16" (Overall width 23")		
	Seat too wide	Seat too narrow	All	Seat too wide	Seat too narrow	All	Seat too wide	Seat too narrow	All	Seat too wide	Seat too narrow	All
No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.
Under 10	-	-	1	-	-	1	-	-	-	-	-	1
10	-	-	2	1	1	3	1	-	1	-	-	3
11	-	-	6	-	-	6	1	-	3	2	-	5
12	-	-	5	-	1	7	2	-	9	2	3	18
13	1	1	22	-	2	14	5	1	30	-	4	29
14	1	-	35	-	2	10	-	2	53	1	5	33
15	4	1	32	-	2	7	1	7	53	-	12	37
16	-	-	21	-	-	-	-	7	45	-	1	6
17	-	3	15	-	-	-	-	8	18	-	2	6
18	-	2	6	-	-	-	-	5	-	-	1	2
19	-	-	2	-	-	-	-	1	1	-	-	-
20+	-	1	1	-	-	-	-	1	1	-	-	-
Not measured	1	-	30	-	1	7	1	2	42	1	1	28
Percentage of the model	4%	5%	100%	2%	18%	100%	5%	12%	100%	4%	19%	100%

indoor clothes. The raw data are given in the hope that it will help in design and in prescribing. (A distribution of hip widths for all wheelchair patients is given in table 18.)

The majority (86%) of wheelchairs were said to have seats which were of just the right width, while of those dissatisfied with seat width more found the seat too narrow (11%) than too wide (3%). Contrasting the Model 8GJ with the wider Model 8G, more find the seat width too narrow for the former (18%) than for the latter (5%). Similarly, contrasting the Model 8BL with the wider Model 8L, more find the seat width too narrow for the former (19%) than for the latter (12%).

One way in which the data can be summarised is given below. For all the series 8 wheelchairs where we know the hip width of the patient, we have obtained a measure of the fit of the wheelchair by subtracting the hip width from the seat width. A negative measurement means that the patient is bulging out of the chair. For different sizes of gap we show the proportion of chairs considered too narrow or too wide.

Looking back at the raw data one feels that an appreciable number of those with the wider chairs could be prescribed an 8BL if these were available. The benefit derived from having the reduced overall width of the 8BL (23") as against the wider 8G or 8L (25" or 23½") is shown by the answers to another of our questions. Whereas 14% of the narrower chairs sometimes got stuck in doorways of the home this proportion was 19% for the wider group of chairs.

Table 36 Seat width minus hip width by percentage considered too wide and too narrow

Seat width minus hip width	Percentage of Model 8s considered		Base (100%)
	too wide	too narrow	
Greater than 4"	% 18	2	40
Greater than 3" up to and including 4"	% 11	6	72
Greater than 2" up to and including 3"	% 1	6	124
Greater than 1" up to and including 2"	% 4	11	132
Greater than zero up to and including 1"	% -	18	113
Hip width equals or is greater than seat width	% -	19	70
All gaps	% 4	11	662†

† Includes 111 cases where patient's hip width was not measured

### Seat depth

Seat depth is the distance from the front edge of the seat to where the backrest joins the seat. More patients found the seat depth just right (91%) than had found the width just right (86%). The 9% dissatisfied with the depth consisted of 6% finding it too short and 3% finding it too deep. There is some suggestion in our results that some of those finding the seat too deep try to remedy the situation with a back cushion (28% of those finding the seat too deep use back cushions

compared with 16% of all wheelchair users). Perhaps, partly because of the use of back cushions, our attempt to relate the complaints to body measurements have been less successful. The body measurement used is from the back to the underside of the knee (measurement 6 in Figure 1) and the analysis has been confined to the model 8 series (see Table 37).

Table 37 Back to underside of knee minus seat depth, by percentage considered too deep and too short

Back to underside of knee minus seat depth	Percentage of Model 8s considered		Base
	too deep	too short	
3" or more	% 2	9	201
2", but less than 3"	% 1	6	107
1", but less than 2"	% 4	5	131
Less than 1"	% 3	2	95
All gaps	% 2	7	662†

† Includes 128 cases where the measurement from back to underside of knee was not taken.

### Backrests

In all, 3% of wheelchairs had backrest extensions. Most of these were used and virtually all were considered comfortable. It will be remembered that our general question asking how wheelchairs could be made more suitable produced 3% of cases where a backrest extension was mentioned. Furthermore, 2% mentioned backrest extensions as a way of relieving aches and pains. So there could well be an unmet need.

A specific question was asked about the angle of the backrest. All patients were asked whether they found the backrest angle 'Too upright, too much at an angle, or just right'. Their answers are shown in table 38 for the different model types, since one of these, the 8BL, has a more upright back than the other model 8s.

Table 38 Backrest angle by model type

Model type	Backrest angle specified	Backrest angle is			Base (100%)
		too up-right	too much at an angle	just right	
Model 8G	15°	% 9	2	89	161
Model 8GJ	15°	% 8	-	92	50
Model 8L	15°	% 14	5	81	238
Model 8BL	10°	% 18	2	80	156
Model 9	15°	% 11	3	86	135
Model 9L	15°	% 9	2	89	62
Model 13	-	% -	-	100	30
Other models	Adjustable	% 11	3	86	135
All models		% 12	3	85	967

Taking all the wheelchairs together 85% were considered just right. Far more patients considered the backrest too upright (12%) than at too much of an angle (3%). It is noteworthy that the Model 8BL has the highest proportion considered too upright and that the Model 13, which has an adjustable backrest, was always considered just right. Patients' views about the suitability of the backrest angle are related to whether they said that they experienced aches and pains in the back (see table 39).



Table 39 Aches and pains in back by whether backrest angle is too upright, too much at an angle or just right

	Backrest said to be		
	too upright	too much at an angle	just right
Proportion experiencing aches and pains in back	28%	17%	8%

In answer to another question addressed to those who were unable to sleep in their chair but wished to do so, the majority said this was because the backrest was too upright.

### Footrests and footboards

We have already called attention to the fact that the bad points of the wheelchair included 5% of cases where footrests and footboards were considered uncomfortable and 6% of cases where swivel footrests were said to be loose. We also found that in 7% of cases patients suggested the improvement of footrests as a way of making the wheelchair more suitable for people with similar disabilities to themselves.

During the interview we asked a series of specific questions about footrests and footboards. Our first question on this topic asked about their provision. The vast majority (96%) of wheelchairs had been provided with footrests or footboards; they consisted of 88% which had been provided with footrests and 8% which had been provided with footboards. The remaining wheelchairs (4%) which had neither footrests nor footboards were made up of glideabout chairs designed to be propelled by patients pushing with their legs or punting with sticks and wheelchairs where footrests or footboards had not been supplied because patients had had both legs amputated.

A question on use revealed that 7% of wheelchairs had been provided with footrests and footboards which were never used. A further 20% had footrests and footboards which were used only sometimes. Investigation of the 7% of cases where the footrests or footboards were never used revealed that in the majority of these cases this was because the patient found them uncomfortable. For example, some patients said they got aches and pains in their legs because the footrests or

footboards were too high while others complained that the heel loops made the footrests uncomfortable for the feet. On the other hand there were a few cases where patients did not use the footrests or footboards provided because these knocked into furniture and doorways when patients were moving around.

We specifically asked patients who used their footrests and footboards whether their feet stayed on or whether they sometimes slid off or got caught. In as many as 26% of all cases patients said that their feet sometimes slid off and in 2% of cases they said their feet sometimes got caught (in 1% of cases patients' feet had both slipped off and got caught). This is despite the fact that the answers to another question showed that 44% of wheelchairs had footrests or footboards supplied with heel loops and 7% had ones provided with footstraps. The evidence suggests that only a proportion of heel loops and footstraps are effective in preventing patients' feet from sliding off or getting caught since, when we asked in what ways these helped, only about a half were said to prevent feet sliding off. Table 40 shows the use of footrests and footboards and their safety, analysed by model.

Model 13 compares favourably with other chairs in respect of the safety of the user's feet.

We also asked patients whether their wheelchairs had been provided with elevating legrests. Only 4% of wheelchairs had been provided with them and virtually all were said to be comfortable.

## 5.3 Operating difficulties

### Transferring to and from the wheelchair

We asked patients whether they needed help in getting in and out of their wheelchair or whether they could always do so unaided. In the majority of cases (71%) patients needed help either always (55%) or sometimes (16%). Table 41 analyses, for different model types, whether or not help is needed; one notes that the proportion of cases where patients always need help in getting in and out is highest for Model 13s (87%).

Table 40 The use and safety of footrests and footboards and their safety analysed by model

Use of footrests and footboards	Model									All models
	8G	8GJ	8L	8BL	9	9L	13	Others		
	%	%	%	%	%	%	%	%	%	
Wheelchair has none	2	8	1	7	2	1	7	2	4	
Never used	10	8	5	8	5	3	3	8	7	
Sometimes used	21	22	26	26	17	13	-	11	20	
Always used	67	62	68	59	76	83	90	79	69	
Base (=100%)	161	50	238	156	135	62	30	135	967	
- non-powered NHS wheelchairs in use										
Accidents to feet	%	%	%	%	%	%	%	%		
Feet slide off	26	33	29	22	25	25	10	28	26	
Feet get caught	2	4	1	2	3	-	-	3	2	
Base	161	50	238	156	135	62	30	135	967	
- non-powered NHS wheelchairs in use										

Table 41 Help needed in transferring to and from wheelchair analysed by model type

Model type		Always needs help	Sometimes needs help	Always unaided	Base (100%)
Model 8G	%	62	10	28	161
Model 8GJ	%	61	8	31	50
Model 8L	%	46	18	36	238
Model 8BL	%	46	19	35	156
Model 9	%	59	15	26	135
Model 9L	%	71	13	16	62
Model 13	%	87	10	3	30
Other models	%	34	18	28	133
All models	%	55	16	29	967

It will be remembered that early in the interview patients were asked, for each arm and hand, whether they had complete use, limited use or no use. An analysis of these use questions shows that the amount of use patients have in their arms and hands directly affects the amount of help they require in getting in and out of their wheelchairs. In table 42 we give the amount of help required as a function of the use patients have in their arms only; we have not given the corresponding analysis for hands because we found that limited use of hands affects getting in and out of a wheelchair in the same way as limited use of arms.

Although a large proportion of patients needed assistance at least sometimes when getting in and out of the wheelchair, answers to another question indicate that most of them had no problem in obtaining it; in the vast majority of cases (90%) help was available when it was needed. This was so even among patients who always needed help.

In reply to a question on whether patients had ever been stuck or in difficulties when getting in and out of the wheelchairs, for only 8% of wheelchairs did patients say they had. This proportion depends on whether the armrests are removed when patients get in or out of the chair; it is as high as 15% among cases where they are removed compared with only 6% among cases where they are not. Patients said they hurt themselves in a third of cases where they had been stuck or in difficulties.

Table 42 Help needed in transferring to and from wheelchair, analysed by use of arms.

Help needed in transferring	Patient has complete use of both arms	Patient does not have complete use of both arms
	%	%
Always needs help	37	66
Sometimes needs help	17	15
Always unaided	46	19
Base (=100%)	245	722
- non-powered NHS wheelchairs in use		

### Hand-propulsion

Over two-thirds (72%) of wheelchairs in use were designed to be propelled by the patients themselves using handrims. However we found that for 42% of

such wheelchairs the handrims were not used<sup>1</sup> at all; only 58% were used. This means that there were about 36,000 hand-propelled wheelchairs on issue to adult wheelchair patients who never used handrims. The 58% where the rims were used divides into 48% where the patient was said to have no difficulty in reaching or gripping the handrims and 10% where there was some difficulty. In virtually all cases of difficulty the patient had difficulty in gripping the handrims (10%), but in 3% of cases the patient also had difficulty in reaching the handrims. A small number of patients also said the handrims were too rough: in contrast another small group said the handrims got slippery.

An analysis of the extent to which patients had the use of arms and hands shows that, despite the fact that details of any weakness or amputations of the upper limbs should have been given on the prescription form, less than a half (41%) of hand-propelled wheelchairs were on issue to patients who had complete use in both arms and hands. Further analysis, given in table 43, shows how limitations in the use of arms leads to non-use or difficulty with handrims; it raises the question of whether a wheelchair without provision for hand propulsion would have been better.

Table 43 Difficulty with handrims, analysed by use of arms

Whether uses handrims	Patient has complete use of both arms	Patient does not have complete use of both arms
	%	%
Does use	75	45
Does not use	25	55
Base (=100%)	298	400
- hand propelled NHS wheelchairs in use		
Difficulties with handrims	%	%
No difficulties	69	32
Difficulties with -		
reaching handrims	1	5
gripping handrims	5	14
Base	298	400
- hand propelled NHS wheelchairs in use		

### Steering

In the section on overall satisfaction one of the bad points mentioned in 16% of cases was that the wheelchair was difficult to steer. During the course of the interview we asked two specific questions on steering. The first of these asked patients who had hand-propelled wheelchairs what difficulties they had in steering the chair. The second asked patients who were ever pushed in their wheelchairs outdoors what difficulties the person pushing had in turning corners.

The first question revealed that patients had difficulty steering 16% of hand-propelled wheelchairs. The proportion of wheelchairs found difficult to steer does not vary appreciably between model types. Patients attributed their steering problems both to their disabilities and to their wheelchairs. For example, 4% of hand-propelled wheelchairs were said to be difficult to

<sup>1</sup> In 2% of cases the handrims had been removed, leaving 40% with handrims.

steer because the patient had little or no use in their arms and hands, while 6% were difficult to steer because they veered off course for no reason apparent to the patient. Castor wheels were said to cause difficulties in 3% of cases.

We found that difficulties with steering seem to be mainly a function of the use patients had in their arms (see table 44) and hands but it is worth noting that, even among patients who had complete use in both arms and hands, as many as one in six of those who used handrims said they had steering difficulties.

Our second question dealt with the problems, not of the patient, but of the person who pushed the wheelchair. Of all wheelchairs in use 21% were never pushed outdoors. The remaining 79% that were pushed included 10% where the person pushing had difficulty in turning the chair round corners. As was the case with hand-propulsion indoors, the main difficulty was that the wheelchair veered off course (4%). Other difficulties mentioned included weight (2%) and problems arising when tilting the wheelchair on the back wheels (3%). In table 45 one can contrast the self-propelling Model 8s with the Model 9s and 13s which are pushchairs.

**Table 44 Difficulties with steering hand-propelled wheelchairs, analysed by use of arms**

Whether has steering difficulties	Patient has complete use of both arms	Patient does not have complete use of both arms
	%	%
Does not use handrims	25	54
Uses handrims but has difficulties	13	18
Uses handrims and has no difficulties	62	28
Base (=100%)	298	400
<i>- hand propelled NHS wheelchairs in use</i>		
Kind of difficulty	%	%
Veers off course	6	8
Castor wheels stick	2	2
Patient has limited use of upper limbs	1	7
Other difficulties	4	3
Base	298	400
<i>- hand propelled NHS wheelchairs in use</i>		

**Table 45 Pushers' difficulties with turning corners outdoors analysed by model type**

Whether pusher experienced difficulty	Model								All models
	8G	8GJ	8L	8BL	9	9L	13	Others	
	%	%	%	%	%	%	%	%	%
Not pushed outdoors	26	24	21	22	7	5	-	42	21
No difficulty turning	66	64	71	74	73	74	77	56	69
Difficulty turning	8	12	8	4	20	21	23	2	10
Base (=100%)	161	50	238	156	135	62	30	135	967
<i>- non-powered NHS wheelchairs in use</i>									
Kind of difficulty with chair	%	%	%	%	%	%	%	%	%
Veers off course	4	6	4	2	7	6	3	2	4
Too heavy	2	4	-	1	4	10	13	*	2
Problems when tilting on back-wheels	1	-	-	-	9	11	17	*	3
Other difficulties	1	4	4	1	5	2	3	-	2
Base	161	50	238	156	135	62	30	135	967
<i>- non-powered NHS wheelchairs in use</i>									

## Operating the brakes

Patients with hand-propelled wheelchairs were asked whether they themselves could operate the brakes 'Easily, with difficulty, or not at all'. The majority of brakes (74%) could be operated easily but 13% could only be operated with difficulty, while 13% could not be operated at all. In the majority of cases non-use or difficulty was considered by patients to be due to their own physical condition; however, 4% of all hand-propelled wheelchairs were said to have brakes that were too stiff and 3% to have them in an awkward position for the patient to use.

Patients' views that most difficulties with operating brakes can be attributed to their own physical condition are supported by the data, for in table 46 we find that patients who do not have complete use in their arms are the least likely to be able to operate the brakes easily. An analysis by the use patients had in their hands gave a similar result.

Where the hand-propelled wheelchair was pushed around by some person other than the patient we asked whether this person could deal with the brakes. Of such people 2% could not operate the brakes and 6% could do so only with difficulty. However, three-quarters of these two groups proved to be cases where the person pushing as distinct from the patient had limited use of their arms or hands.

Elsewhere in the report we note that 4% of all wheelchairs in use were said to be in need of repairs to the brakes and that 7% had had repairs to brakes within the last twelve months.

**Table 46 Difficulties with operating brakes analysed by use of arms**

Whether has difficulties with brakes	Patient has complete use of both arms	Patient does not have complete use of both arms
	%	%
Patient can operate brakes easily	93	60
only with difficulty	5	19
not at all	2	21
Base (=100%)	298	400
<i>- hand-propelled NHS wheelchairs in use</i>		



## Folding wheelchairs

About nine out of ten wheelchairs were designed to fold. We asked patients how often these folding wheelchairs were in fact folded (in winter time). Some 30% were folded at least once a day, 20% less than once a day but at least once a week, 11% less than once a week but at least once a month and 17% less than once a month, leaving 16% that were never folded and 6% where the wheelchair was not used in winter. Further analysis shows that patients in employment fold their wheelchair more frequently than do other patients.

Few of the reasons given for never folding the chair suggest real difficulty in so doing. However, there is a variation in the proportion never folded by model which suggests that the weight of the chair has some influence. One sees from table 47 that the proportion never folded is higher for the 8G and 8GJ than the lighter 8L and 8BL models. For the 'car chair' models, the 9 and the 9L, the proportions are lower but it is the heavier 9 which is more frequently not folded at all. The chair which is most likely not to be folded at all is the heavy model 13, which has, however a different folding mechanism.

We asked patients whether they always needed assistance, sometimes needed assistance, or never needed assistance in folding those wheelchairs which were ever folded. In well over a half (60%) of all cases of folding wheelchairs, patients needed assistance at least some of the time; in all but a few of these cases patients said they always needed help. We have already mentioned how the proportion never folded appeared to vary with the weight of the chair; the data also suggest that patients are more likely to need assistance with folding the heavier chairs.

Disability is the major reason given by patients for being incapable of folding their wheelchairs without assistance; the 60% of cases where assistance was necessary included 24% where patients needed help because they had little or no use in their lower limbs, 15% where they had very little strength generally and 15% where they had little or no use in their arms or hands. Only a small proportion (5%) of wheelchairs were said to be too stiff or too heavy for the patients to fold alone.

On the other hand, in reply to another question, patients were more critical about the folding mechanism. For all wheelchairs ever folded, we asked

patients whether they or their helpers had any difficulties with folding the chair. In 9% of cases there were difficulties in folding the chair and patients felt that nearly all difficulties were caused by the design of the wheelchair rather than by the disability of the patient or helper. In particular, 4% of folding wheelchairs were too stiff, 1% had footrests or legrests which were either in the way or difficult to remove and 1% had other parts, such as folding backrests, which caused difficulty. We analysed these difficulties by model but found no large differences.

## 5.4 Follow-up of grievances

We have already seen that an appreciable proportion of adult wheelchair patients expressed some dissatisfaction during the interview with either their wheelchair or the service they had received. Because of their age and the disabilities they suffered from, these patients could be expected to have some difficulty in explaining their problems, especially those caused by mechanical faults in their wheelchair. So, with the permission of the patients, we arranged for a sub-sample of those with grievances to be visited by officials from the Appliance Centres to find out what could be done.

Ideally we would have liked to follow up every grievance but time and the resources available at the Appliance Centres did not permit this. We therefore took a sub-sample of one hundred patients and selected from this sub-sample everyone who expressed some dissatisfaction or who appeared not to be getting the standard of service they were entitled to. This method produced seventeen wheelchair patients we felt should be followed up.

We asked the managers of the Appliance Centres at which the seventeen patients were registered to arrange check-ups. Furthermore, we asked for the necessary action to be taken by the Appliance Centres when a grievance was found to be genuine.

The seventeen patients who complained were registered in seven of the eight Appliance Centres involved in the survey, and all seven Appliance Centres co-operated in the follow up. Only one form was not returned; the patient had died in the three months between the main survey and the follow up.

Table 47 Frequency of folding analysed by model type

Frequency of folding (winter time)	Model								All models
	8G	8GJ	8L	8BL	9	9L	13	Others	
	%	%	%	%	%	%	%	%	%
At least once a day	28	16	37	26	30	26	4	29	30
Less than once a day, at least once a week	15	16	20	26	18	31	18	17	20
Less than once a week, at least once a month	10	14	10	14	9	16	7	10	11
Less than once a month	18	26	15	17	16	11	18	23	17
Never	22	25	13	16	12	6	46	17	16
Not used in winter	7	3	5	1	15	10	7	4	6
Base (=100%)	161	50	238	156	135	62	30	79	911
- non-powered NHS folding wheelchairs in use									
Weight of chair (lbs)	50	50	40	37	45	34	64	-	-

Table 48 Follow-up of grievances

Reasons for follow-up	Patient was seen by	Comments and recommendations
<b>Present wheelchair unsuitable</b>		
Test capability of patient to use an outdoor right-arm propulsion wheelchair	Technical Officer	Left side useless because of recent stroke. An Everest and Jennings right-arm propulsion wheelchair has been recommended
Test capability of patient to use an indoor right-arm propulsion folding wheelchair	No contact made because patient had recovered sufficiently so as not to need an indoor chair	See previous column
Test capability of patient to use an indoor left-arm propulsion wheelchair	No contact made because such a chair was supplied but then withdrawn because passageways too narrow	See previous column
Test capability of patient to use an outdoor right-arm propulsion wheelchair	No contact made because patient has recently been supplied with a model 9LR folding car chair	See previous column
Test capability of patient to use an all-purpose right-arm propulsion wheelchair	No contact made because patient is satisfied with a model 8BL	See previous column
Test capability of patient to use an outdoor right-arm propulsion wheelchair	Medical Officer	An Everest and Jennings right-arm propulsion wheelchair has been recommended
Test capability of patient to use an outdoor left-arm propulsion wheelchair	No contact made because patient is satisfied with a model 8L which has been supplied since the interview	See previous column
Test capability of patient to use an outdoor left-arm propulsion wheelchair	Technical Officer	A Vessa 28B has been recommended
Test capability of patient to use an all-purpose right-arm propulsion wheelchair	No contact made because Technical Officer has already recommended this wheelchair, delivery expected soon	See previous column
Test capability of patient to use an all-purpose self-propelling wheelchair	Technical Officer	A model 8L for indoor and outdoor use has been recommended
<b>Present wheelchair has mechanical faults</b>		
Vessa 8BL has loose brakes	Technical Officer	Left brake loose, wheel and castor bearings need adjusting, and handrims need to be replaced. Approved Repairer notified
Vessa 8BL has split seat and buckled castors	Technical Officer	New seat canvas already supplied and new castor wheels are to be ordered
Model 8G is very stiff and too heavy to push	Technical Officer	A model 8BL has been recommended and issued in place of a Model 8G
Screws which secure tray on Model 8BL are sharp and tear patient's clothes	Approved Repairer	Approved Repairer has cut off the protruding screw threads
Model 8BL has flat right tyre	No contact made because sister in charge of home claims that tyres are satisfactory	See previous column
Barrett 18C-17 has broken right brake and is also too stiff to fold	Approved Repairer	New tyres and castor wheels required but brakes and folding mechanism satisfactory
Bencraft 8L has flat tyre and is also too heavy and too stiff to fold	No contact made because patient had died	See previous column

As shown in table 48, ten of the seventeen complaints were where wheelchairs were thought to be unsuitable and the remaining complaints were associated with mechanical faults in the wheelchairs.

In all except one of the ten cases where the wheelchair was considered unsuitable, patients could not hand-propel their wheelchairs because they were paralysed or partially paralysed on one side of their body. We found that two of these patients were capable of single-arm propulsion. Another was found to be eligible for a Vessa 28B attendant-controlled powered wheelchair for outdoor use. In two cases the patients had had their wheelchairs replaced with more suitable models shortly after the first interview. In another case the patient had already been tested for a one-arm-propulsion wheelchair and was now awaiting the delivery of this type of chair. The single case which was unrelated to the possible need for a one-arm-propulsion wheelchair concerned a patient who had a pushchair and had expressed, during the interview, a desire for a general purpose self-propelling wheelchair. A Technical Officer recommended that this patient should be issued

with a Model 8BL. Three remaining patients who were thought to have unsuitable chairs declined to be seen because they were completely satisfied.

Five of the seven patients who referred to mechanical faults in their wheelchairs had, in the opinion of the Appliance Centre, a genuine grievance; they consisted of four cases where repairs were needed and one case where the chair needed replacing.

In summary, we found twelve cases where patients had a genuine grievance; seven patients had chairs which were unsuitable (including three patients who needed single-arm-propulsion chairs) and five patients who had chairs which were in a state of disrepair. In terms of all adult wheelchair patients, we estimate that there are approximately three thousand who are paralysed or partially paralysed on one side of their body who, if given a single-arm-propulsion wheelchair, would be capable of using one. A further four thousand do not now have the type of wheelchair most suited to their circumstances and five thousand have a wheelchair with a mechanical fault.

## 6 Patients' views on the wheelchair service

### A description of the organisation

There are many ways of obtaining wheelchairs; on a temporary basis from local authorities, hospitals or voluntary organisations and on a permanent basis from the National Health Service, voluntary organisations or private manufacturers. Here we are only concerned with NHS wheelchairs supplied on a permanent basis. In England, the supply of such chairs is the responsibility of the Department of Health and Social Security; for Wales, the Welsh Office is responsible but avails itself of the provisory facilities arranged by the Department of Health and Social Security. The DHSS runs a number of centres in England called Appliance Centres (or Artificial Limb and Appliance Centres) through which the distribution of all NHS wheelchairs is organised.

Until 1972, only consultants in hospitals could recommend wheelchairs on the National Health Service, but then the system was changed so that family practitioners as well as any doctor working for the National Health Service in a hospital or for a local authority, could recommend that a person be issued with a wheelchair. Each hospital doctor and local authority doctor should have been issued with 'The handbook of wheelchairs and hand-propelled tricycles', reference number MHM 408, which has been designed to help them make their recommendations, and each family practitioner should have been issued with an abbreviated form of this handbook, reference number MHM 408 GP. The longer version of the handbook gives details of all standard non-powered wheelchairs available to permanent users, in terms of the standard specification, the special design features available, the accessories that can be supplied and the type of patient for whom the wheelchair is suitable. Further guidance is provided in the form of notes which summarise the procedure involved in issuing a wheelchair. No details are given of electrically-powered wheelchairs because, although a doctor may recommend one, it is up to the Appliance Centre to decide which type of electrically-powered wheelchair, if any, is suitable for the patient. The abbreviated form of the handbook gives details of some of the special design features available; it does not contain information on any of the accessories available. Amendments are sent when new models are introduced or when there is a change in specifications. The doctor's recommendation form AOF SG, enables him to give personal details of the patient, such as height, weight, age, blood pressure and disability, as well as his assessment of the type of wheelchair most suitable for the patient together with any modifications and

accessories required. This recommendation is sent to the nearest Appliance Centre. If the doctor has any difficulty in deciding upon the most suitable wheelchair for the patient, he can seek the assistance of the Appliance Centre, which will, if necessary, invite the patient to attend the centre for an examination by the medical officer.

When the recommendation for a non-powered wheelchair is received by the Appliance Centre, arrangements are made to supply the chair as recommended unless there is some clear indication that the chair would be quite unsuitable. In the latter case the medical officer at the centre will decide on a suitable chair after, if necessary, examining the patient, the recommending doctor being advised of the outcome. More than one type of wheelchair may be provided if this is essential for the needs of the patient.

The majority of non-powered wheelchairs are supplied from stock held at the local Centre or approved repairer. Models less commonly recommended have to be provided from a central chair store or, if the chair is very special, it may have to be built specially. The time taken to supply a chair will therefore depend on these factors and may vary from about immediate delivery from local stock to some months for a specially-tailored chair. If a readily-available wheelchair will be of some use to a patient whilst awaiting a special chair, this may be provided on a temporary basis.

Postal enquiries are made three months after issue to confirm the continued suitability of the chair and thereafter at three-year intervals, if the patient has not been in touch with the centre in the meantime.

Maintenance and repairs are paid for by the DHSS. In general, this work is carried out by approved repairers who work under the general direction of the technical staff of the DHSS, but minor repairs may be arranged by the patient, who can claim reimbursement from DHSS.

### Overall satisfaction

During the interview we asked patients two general questions about their level of satisfaction with the present NHS arrangements for providing and maintaining wheelchairs. The first asked patients to rate the NHS wheelchair service as 'Very satisfactory, satisfactory, or not very satisfactory'. The second asked them in what ways they thought the method of providing and maintaining wheelchairs through the NHS could be improved. In this sub-section we look at the replies patients gave to these two questions.

In answer to the rating question, a half (49%) of patients said they were very satisfied with the NHS wheelchair service, 44% said they were satisfied and only 7% said they were not very satisfied. These proportions did not vary to a great extent either with wheelchair type or with the procedure patients went through to obtain their wheelchairs.

Perhaps not surprisingly, the answers to a similar rating question about patients' level of satisfaction with their own wheelchairs indicate that patients' level of overall satisfaction with the NHS wheelchair service is closely linked to their level of satisfaction with their own wheelchairs. Thus as we can see in table 49 among those cases where patients described their own wheelchair as being very satisfactory, only 2% considered the NHS wheelchair service not very satisfactory; but among those cases where patients described their own wheelchair as not very satisfactory as many as 32% also described the wheelchair service as not very satisfactory.

Table 49 Level of satisfaction with wheelchair service, by satisfaction with own wheelchair

Satisfaction with wheelchair service	Satisfaction with own wheelchair		
	Very satisfied	Satisfied	Not very satisfied
	%	%	%
Very satisfied	73	28	12
Satisfied	25	65	56
Not very satisfied	2	7	32
Base (=100%)	472	410	85
- non-powered NHS wheelchairs in use			

From table 50 it appears that those patients who had least experience of the wheelchair service (because they became users only recently) were the ones who were most satisfied with it; 59% of those who had been wheelchair patients for less than a year said that they were very satisfied with the wheelchair service, whereas only 41% of those who had been patients for 10 years or more said they were very satisfied. This is probably due to the fact that people who have become wheelchair patients only recently are less likely to have had any bad experiences with the wheelchair service, for we found that the proportion who were not very satisfied with the wheelchair service increased from 5% among patients who had never been without their wheelchair because the one they were using had been

Table 50 Level of satisfaction with wheelchair service, by number of years as a wheelchair patient

Satisfaction with wheelchair service	Number of years as a wheelchair patient		
	Less than one	One to nine	Ten or more
	%	%	%
Very satisfied	59	52	41
Satisfied	35	43	51
Not very satisfied	6	5	8
Base (=100%)	120	582	276
- adult wheelchair patients			

taken away to be repaired or replaced to 17% among those who had at some stage been without their wheelchair.

In answer to our question on the provision and maintenance of wheelchairs by the National Health Service, only a third (30%) of patients suggested any improvements; some patients were able to suggest more than one improvement (see table 51). The suggestion most frequently made was that there should be regular visits to patients by officials from the Appliance Centres (7%). Other suggestions made quite often were that there should be shorter delivery periods (4%), a quicker repair service (4%) and more tuition given to patients on the use and maintenance of their wheelchairs (3%). Only 2% said they would like to see more information given about the service. Many other suggestions were made by patients, none of which were suggested by more than one per cent. Some patients regretted that the clinic was not nearer their own home, others said they thought the standard of servicing should be improved and, in a few cases, that steps should be taken to ensure that the correct wheelchair was prescribed. A few patients said they would like to see the wheelchair service providing more information about different types of wheelchairs and about modifications and extras; and a few said they would like to have a spare wheelchair (or spare parts for one) or at least easy access to them should their own wheelchair break down.

With this general background to the level of satisfaction and to the variety of suggestions made, we will now look in more detail at prescribing problems, instruction in the use of chairs, and repair and maintenance.

Table 51 Patients' suggestions for improving the wheelchair service

Whether patient suggested improvements in provision and maintenance of wheelchairs	
Suggested improvements	%
Did not suggest improvements	70
Base - adult wheelchair patients	978
Suggestions made	%
Regular visits by Appliance Centre official	7
Shorter delivery period	4
Quicker repair service	4
More tuition on use and maintenance	3
More information about wheelchair service	2
Other suggestions	13
Base - adult wheelchair patients	978

## 6.1 Problems of recommendations

### Introduction

It should be noted that as many as 18% of wheelchairs were more than five years old. This means that, for some patients, the events being recalled in this section will have happened some years before and as such rely heavily on memory. However, there is no reason to

believe that the results are invalid. Furthermore we found no evidence to suggest that patients' views of the service had changed over the years.

### The first steps taken in getting the chair

During the course of the interview we asked for the identity of the person who first suggested that the wheelchair was needed; in cases where the need was first suggested by a person from outside the wheelchair service we also asked for the identity of the person subsequently contacted. It is possible that in some cases the supply of a wheelchair may have been arranged without the prior knowledge of the patient and this may have been the reason why in about one in ten cases patients could not think of anybody in particular who had first suggested the need for the chair.

However, the majority of wheelchairs (nine out of every ten) were suggested by somebody in particular; about three-quarters by people working for the National Health Service and about one-fifth by other people. People working for the National Health Service included general practitioners (29%), hospital doctors (22%) and technical officers (8%). Where the need was first suggested by somebody outside the NHS, most people subsequently approached a general practitioner (33%), an Appliance Centre doctor (25%) or some other doctor (23%). Of course, others may have been in contact with a doctor at a later stage.

We have already mentioned that in certain circumstances a patient can be supplied with more than one wheelchair. In a relatively high proportion of cases (21%) the need for a second chair was first suggested by a technical officer. These officers also play a role in first suggesting the need to replace a wheelchair with a new one; 13% of replacement chairs were first suggested by technical officers (see table 52).

Table 52 Person who first suggested chair was needed by whether or not it was the patient's first chair

Person who first suggested chair was needed	Whether or not patient's first chair			All chairs
	First ever	Additional	Replacement	
	%	%	%	%
Nobody in particular	9	21	12	11
General practitioner	33	15	28	29
Hospital doctor	25	12	20	22
Other hospital staff	7	1	4	5
Hospital (no details given)	4	4	4	4
Technical Officer	-	21	13	8
Spouse	7	5	6	6
Other relative	8	4	6	6
Friend	2	2	2	2
District nurse	5	8	4	4
Somebody else	4	7	2	3
Base	475	89	502	1066
- non-powered NHS wheelchairs				

Table 53 shows the part played by doctors and technical officers in the initial recommendation for a wheelchair. Just under two-thirds of recommendations initially involved either a general practitioner (31%), hospital doctor (24%) or other doctor (6%); presumably the remaining 39% must have, at some stage, been in contact with a doctor. Ten per cent involved a technical officer. Initial involvement by a doctor or technical officer varies with whether the chair was the first one ever issued to the patient, a replacement of an older chair, or an additional chair; it is highest among replacement chairs (77%) and lowest among first ever chairs (66%).

Although since 1972 general practitioners have been allowed to recommend wheelchairs on the NHS, it is interesting to note that the proportion of recommendations initially involving a general practitioner has not risen since that date (see table 54).

Table 53 The part played by doctors and technical officers by whether or not it was the patient's first chair

Proportion of recommendations initially involving a doctor or technical officer	Whether or not patient's first chair			All chairs
	First ever	Additional	Replacement	
	%	%	%	%
Recommendation did not initially involve a doctor or technical officer	34	29	23	29
Recommendation involved -				
general practitioner	34	18	29	31
hospital doctor	28	13	23	24
other doctor	2	14	9	6
technical officer	2	26	16	10
Base (=100%)	475	89	502	1066
- non-powered NHS wheelchairs				

Table 54 Proportion of recommendations involving a general practitioner analysed by whether wheelchair was obtained before 1972 recommendations

Proportion of recommendations initially involving a general practitioner	Wheelchair obtained	
	before 1972	after 1972
	%	%
	29	30
Base - non-powered NHS wheelchairs	513	553

### The role of the Appliance Centre and the clinic

We have already described the role assigned to the Appliance Centre in issuing NHS wheelchairs. We have also mentioned that if a doctor has difficulty in deciding which is the most suitable wheelchair for his patient he can refer the case to the nearest Appliance Centre which can, if necessary, arrange for the patient to visit either the centre or a clinic. The survey showed that in the vast majority of cases (89%) patients did not visit either an Appliance Centre



or a clinic held for wheelchair patients at hospitals. Only a small proportion visited an Appliance Centre (7%) or clinic (4%); the patient was accompanied by the person who pushed the chair on his or her behalf in about two-thirds of these visits. There is some evidence to suggest that it is the most disabled patients who were most likely to visit an Appliance Centre or clinic; this suggests that it may be the most difficult cases, in terms of prescribing a wheelchair, that are sent to an Appliance Centre or clinic.

We asked patients who visited an Appliance Centre or clinic how they travelled; in all but three cases where the patient was staying in the hospital to which the clinic was attached, the visit involved a journey. Approximately half the journeys (49%) were made by ambulance, 48% by car (35% by private car and 13% by hospital car) and the remaining 3% by train. Although nearly all visits involved a journey, in only a fifth of cases did patients complain about travelling difficulties; 6% had difficulty in getting in and out of the ambulance, 4% found the journey too long and 3% complained of travel sickness. The remainder (7%) included patients whose disabilities made travelling very difficult and others who complained of waiting (sometimes up to two hours) for the ambulance or car to take them back. Because of patients' difficulties with travelling to and from the Appliance Centre or clinic and in view of the fact that, among the suggestions for improving the wheelchair service, the most frequently mentioned (by 7% of patients) was regular visits by an Appliance Centre official, perhaps the service should consider extending the circumstances in which the patient is seen at home rather than at the Appliance Centre or clinic.

#### The expectations of those who did not visit an Appliance Centre or clinic

If patients did not attend an Appliance Centre or clinic before being issued with their wheelchair, we asked them whether they thought it would have been useful if they themselves or the person who pushes the chair on their behalf had done so. Less than a quarter (22%) felt it would have been useful, either to themselves (17%) or to the person who pushes the chair (11%). Six per cent felt that it would have been useful for both patient and pusher to do so.

It will be remembered that when we asked patients what could be done to make their wheelchairs more suitable, about a half of the chairs were thought to be capable of improvement in some way. Because of this it is not surprising to find that when we asked patients why they thought they would have found a visit to an Appliance Centre or clinic useful the majority gave answers which indicated either dissatisfaction with the present chair or at least a possibility of a better chair had they made a visit. Such answers included 7% of prescriptions which did not include a visit where patients said a visit would have been useful for finding out about different types of chairs and 3% where patients thought they would have been given the

opportunity to try out different chairs. Another 3% hoped they would have been given the opportunity to choose a more comfortable chair and a further 3% that they could have chosen a chair which was easier to use. Two per cent hoped that by attending an Appliance Centre or clinic they would be given instruction on how to use the chair; we will return to the problem of instruction later in the report.

Patients felt that the person who pushes the wheelchair on their behalf would have benefited by attending an Appliance Centre or clinic in the same way as the patient would have benefited. As before, the majority felt that a visit by the person who pushes the chair would lead to the prescribing of a more suitable chair; 4% mentioned finding out about the different types of chairs available and 2% thought that the person who pushes would be given the opportunity to try out a selection of chairs (see table 55).

**Table 55** Whether visit to Appliance Centre or clinic would have been useful for patient or person who pushes the chair

Whether visit to Appliance Centre/ clinic would have been useful	Patient %	Person who pushes %
Would have been useful	17	11
Would not have been useful	83	89
<i>Base (=100%)</i>	<i>937</i>	<i>892</i>
Reasons why visit would have been useful	%	%
Knowledge of different types of chairs	7	4
Choose a more comfortable chair	3	1
Try out different chairs	3	2
Choose a chair which is easier to use	3	3
Appliance Centre or clinic would learn about patient's needs	2	1
Unsuitable chair would not have been issued	1	1
Choose a narrower chair to pass through doorways	1	1
Learn how to use chair	2	2
Patient would have been measured	1	-
Other reasons	2	1
<i>Base</i> <i>- cases where patient or person who pushes chair did not visit Appliance Centre or clinic</i>	<i>937</i>	<i>892</i>

#### Patients' visits to Appliance Centres or clinics

Patients' answers to two questions which asked about the procedure at the Appliance Centre or clinic show that there is agreement between what patients expected to happen and what does actually happen. The first question asked patients what happened when they visited the Appliance Centre or clinic. The second checked whether patients tried sitting in any wheelchairs when they visited the Appliance Centre or clinic. Patients said two-thirds (66%) of visits included a session where they tried sitting in a wheelchair; these consisted of 25% where the patient tried sitting in only one chair and 41% where the patient tried sitting in more than one chair. Patients said they had medical examinations during 17% of visits, were measured during 17% and were told what was the most suitable

chair at 14% of visits. Other visits were said to include questions about the patient's physical condition (10%). A few patients mentioned being shown a catalogue of wheelchairs, others said that the person who normally pushes the chair on their behalf tried pushing some chairs and some patients said they were asked whether their home had any awkward steps, doorways or passageways.

As stated earlier, patients are sent to Appliance Centres or clinics so that the doctor can decide on a suitable chair; it is not the intention to instruct the patient in how to operate the chair. Because of this it is not surprising to find that, although in about two-thirds of visits patients tried sitting in a wheelchair, in less than a quarter (23%) of visits did patients feel they had learnt anything from their visit. However, consideration might be given to providing some form of instruction to visitors. Patients also felt that very little was learnt by the person who pushed the chair on behalf of the patient.

As a measure of their overall satisfaction with what they learnt during their visits to Appliance Centres and clinics we asked patients to rate these visits as 'Very useful, useful or not very useful'. Because the majority of patients claimed that neither they nor the person who pushes the chair on their behalf learnt anything from visiting an Appliance Centre or clinic, it is not surprising to find that the overall level of satisfaction is low; 19% of visits were said to be very useful, 29% useful and 52% not very useful. Despite this patients felt that over two-thirds (69%) of visits led to better wheelchairs being provided than would otherwise have been the case. However there does not appear to be any appreciable difference in complaints about their wheelchairs between those that involved a visit to an Appliance Centre or clinic and those that did not. For example, table 56 shows that overall satisfaction with

**Table 56** Satisfaction with wheelchair by whether patient visited an Appliance Centre or clinic

Satisfaction with wheelchair	Patient visited Appliance Centre/clinic	Patient did not visit Appliance Centre/clinic
	%	%
Very satisfied	55	48
Satisfied	34	44
Not very satisfied	11	8
<i>Base (=100%)</i>		858
<i>- non-powered NHS wheelchairs in use</i>		

the chair is similar for both groups. Because of this, and in view of the time and effort involved in patients visiting the Appliance Centre or clinic, these visits should be made as beneficial as possible to the patients. We therefore recommend that a review be made of how visits are conducted at Appliance Centres and clinics and in what circumstances such visits should be made.

### Comparing Appliance Centres with clinics

Despite the small bases the answers to our rating question on overall satisfaction suggest that patients

found attendance at wheelchair clinics held at hospitals more useful than attendance at Appliance Centres; the proportions who said 'Very useful' were 29% and 15% respectively (see table 57). Similarly, the proportion who felt that they ended up with a better wheelchair because of their visit was higher among those who visited clinics (77%) than among those who visited Appliance Centres (58%).

**Table 57** Comparing usefulness of Appliance Centres with that of clinics

	Appliance Centre	Clinic
	%	%
Attendance at Appliance Centre or clinic was -		
very useful	15	29
useful	28	29
not very useful	57	42
<i>Base (=100%)</i>		87
<i>- visits by patient to Appliance Centre or clinic</i>		

This greater satisfaction among patients who attended clinics may be explained by the difference between what happens during visits to clinics and what happens during visits to Appliance Centres; in particular, a relatively high proportion of visits to clinics included the taking of a patient's measurements (26%) and enquiries regarding a patient's physical condition (20%) (see table 58).

**Table 58** Comparing procedure at Appliance Centres with that at clinics

Procedure	Appliance Centre	Clinic
	%	%
Tried out wheelchair(s)	62	63
Had medical examination	18	15
Was measured	13	26
Questioned about condition	5	20
Told what was most suitable chair	17	9
Other	31	35
<i>Base - visits by patient to Appliance Centre or clinic</i>		87
<i>- visits often included more than one procedure.</i>		42

*Note: visits often included more than one procedure.*

### Delivery period

We have already mentioned in our description of the wheelchair service that the majority of wheelchairs can be supplied immediately from the stock at the local centre. However, we saw earlier that in answer to a question which asked patients in what ways they felt the method of issuing the chair could be improved, 4% mentioned a shorter delivery period. The answers to a question asking for the length of time from when patients were first told they were going to get a chair to when it was delivered show that many chairs are not supplied immediately; thus, although in 8% of cases patients did not have to wait for the chair because either they were not expecting it (6%) or it was ready when the patient left hospital (2%), the average delivery period was about five weeks. Evidence from this survey also suggests that there are often

considerable delays in supplying wheelchairs; for instance, over a fifth (22%) of wheelchairs took at least eight weeks to be delivered. The DHSS might usefully examine why these delays occur to discover what steps can be taken to shorten the waiting period.

However, it is worth noting that in the majority of cases the patient's mobility was not affected by having to wait for a chair; for example, in 52% of cases, patients said they were not inconvenienced because they had the use of another wheelchair. On the other hand, the 92% of recommendations where the wheelchair was not supplied immediately included 17% where the patient's mobility was reduced; in 9% of cases the patient could not go outdoors, in 2% the patient had another chair which was either unsuitable or not always available and in 2% the patient was either bedridden or restricted to sitting in an easy chair. Other limitations included going outdoors only in a car, walking only short distances, and moving around only with the help of a walking aid.

Table 59 shows that despite the fact that the delivery period is on average constant, regardless of whether the chair is 'First ever, replacement, or additional', the proportion of cases causing a reduction in patients' mobility was highest (28%) among first ever chairs.

Table 59 Length of delivery period and its effect on mobility by whether or not it was the patient's first chair

Length of waiting period	Whether or not patient's first chair			All chairs
	First ever	Additional	Replacement	
Was not expecting chair	%	%	%	%
Chair was ready when left hospital	7	4	5	6
	3	2	2	2
Less than one week	9	8	11	10
1 week, but less than 2 weeks	11	12	11	11
2 weeks, but less than 3 weeks	12	12	16	14
3 weeks, but less than 4 weeks	17	15	16	16
4 weeks, but less than 8 weeks	19	24	18	19
8 weeks or more	22	23	21	22
Whether waiting period affected mobility				
No waiting period - see above	10	6	7	8
Did not affect mobility	62	88	83	75
Did affect mobility	28	6	10	17
Base (=100%) - non-powered NHS wheelchairs	475	89	502	1066
Reasons why mobility not affected	%	%	%	%
Had another wheelchair (temporarily)	22	82	75	52
Too ill to use chair	15	4	3	8
Could manage with walking aid	6	-	1	3
Used a car	5	3	2	3
Did not go out anyway	3	2	1	2
Bad weather prevented trips outdoors	1	-	*	1
Other reasons	13	-	5	7
Base - non-powered NHS wheelchairs	475	89	502	1066
Reasons why mobility affected	%	%	%	%
Could not go outdoors	13	4	5	9
Other chair unsuitable not always available	1	-	3	2
Patient bedridden, chair bound	2	-	1	2
Could only go outdoors in car	2	-	1	1
Could only walk short distances	3	-	*	1
Could only move with help of walking aid	2	-	*	1
Restricted the use of a car	1	2	*	1
Other limitations	5	-	1	3
Base - non-powered NHS wheelchairs	475	89	502	1066

This high proportion is probably caused by the relatively low proportion of first ever wheelchair recommendations (22%) where there was another chair available (on temporary loan) during the delivery period. The importance of having another wheelchair available during the delivery period is emphasised by the fact that the proportion of delivery periods which caused a reduction in mobility dropped from 40% among cases where there was not another wheelchair available to only 7% where there was. On this basis, if delays in supply are unavoidable it may be well worth considering either giving priority to patients who do not have another wheelchair already or increasing the supply of wheelchairs for temporary loan during the delivery period.

## 6.2 Instruction

We have already indicated that in answer to a question about possible improvements in the wheelchair service, 3% of patients felt that more tuition should be provided in the use and maintenance of wheelchairs.

In answer to another question, in a fifth (21%) of cases patients said that either they themselves (7%) or the person pushing them (16%) had had problems in learning to use the wheelchair (in 2% of cases both

patient and attendant were said to have had problems). Although some of the problems mentioned would seem to suggest that patients may have been thinking about the general difficulties of using their wheelchair rather than about specific learning difficulties, these problems do indicate that more instruction in the use of wheelchairs may be desirable.

Among the specific learning problems mentioned by patients were the difficulty of steering the wheelchair (2%) and the difficulty in propelling the wheelchair because of a lack of strength in their hands (2%). Also mentioned were problems associated with the castor wheels, difficulties in going up and down kerbs and steps or passing through doorways, and problems in folding the wheelchair. The person pushing the chair was said by the patient to have had similar problems; these problems included going up and down kerbs and steps (7%), steering (3%), castor wheels (3%), and chairs which were either too stiff or too heavy to push (2%).

Our questionnaire included two specific questions about instruction. The first asked for details of any advice sought, by the patient or somebody else when the chair was delivered or shortly afterwards, about the use and maintenance of wheelchairs. The second asked about any instruction booklet which the patient may have received with the chair.

In answer to the advice question, only in 13% of cases was advice sought on the use and maintenance of the wheelchair, either when the chair was delivered or shortly afterwards. Mostly the advice was sought either by the patient (8%) or by his or her spouse (4%). On other occasions enquiries were made by some other relative (2%), a member of the hospital staff (1%) or by somebody else (1%). Although advice was sought in 13% of cases, in only 9% of cases was any advice given to those who sought it, either to the patient (5%) or to the person who pushed the chair (4%). Where advice was sought and received, it was usually given either by the person who delivered the chair (4%) or by the technical officer (4%); other people who gave advice included medically qualified people such as doctors and nurses (2%), people working at the Appliance Centre (1%) and others (2%).

The advice given included information on the general care and maintenance of wheelchairs (2%), hints on how to fold the chair (2%), and instructions on how to steer the chair (2%), go up and down kerbs (1%) and use the brakes (1%). It is worth mentioning that in only 17 cases among our sample of 1,066 did patients say that somebody explained how to get the wheelchair repaired; the repair of wheelchairs is looked at in greater detail in the next section.

### Instruction booklets

Although it is supposed to be standard procedure that an instruction booklet is issued with a chair when it is the first occasion that the recipient has been provided

with that type of chair, in many cases this appears not to happen. In answer to our question about instruction booklets, we found that in over three-quarters (79%) of cases patients claimed that no instruction booklets had been given to them. Even among those who had received their wheelchair within the last year, as many as 72% said they could not recall having been given an instruction booklet. DHSS may wish to investigate the reasons why so few booklets have been handed out.

It is gratifying to find that in nearly all cases where instruction booklets were said to have been received they had been read by either the patient (62%), his or her spouse (43%), some other relative (24%) or by a friend (6%). However it is noteworthy that over a fifth of readers (21%) were said to have learnt nothing from reading the instruction booklet. This raises the question of whether the instruction booklets at present handed out with NHS wheelchairs need to be rewritten.

Details of what people are said to have learnt from reading an instruction booklet are given in table 60. Knowledge gained included the general care and maintenance of wheelchairs (38%), and how to operate wheelchairs (24%). Also mentioned were how to fold wheelchairs (13%), the mechanics of the chair (12%) and the repair procedure (11%). Fourteen per cent mentioned other items including details of extras which can be supplied with the chair and information on modifications which can be made to the chair.

**Table 60 Knowledge gained from reading an instruction booklet**

	%
None	21
General care and maintenance	38
How to operate chair	24
How to fold chair	13
Repair procedure	11
The mechanics of the chair	12
Other items	14
<i>Base - readers of instruction booklets</i>	<i>294</i>

*Note: some patients claimed to have learnt more than one thing.*

As a summary of their feelings about instruction booklets, we asked patients to rate the instruction booklets they had received as 'Very useful, useful or not very useful'. In answer to this question 27% of booklets were said to be very useful, 55% useful and 18% not very useful. Thus there does not appear to be great enthusiasm for the instruction booklets patients had been given. This again suggests that a redesign of instruction booklets might be considered.

When we asked patients whether it would have been useful if an instruction booklet had been handed out with the chair only a small proportion (21%) said a booklet would have been useful either for themselves (12%) or for the person who pushed the chair on their behalf (15%). Six per cent said a booklet would have been useful both for themselves and for the person who pushed the chair on their behalf. To help in any

redesign of instruction booklets we give, in table 61, ways in which those patients who did not receive instruction booklets thought they would have been useful.

**Table 61** Whether an instruction booklet would have been useful

	%
Would have been useful	21
Would not have been useful	79
<i>Base (=100%)</i>	<i>842</i>
<i>- cases where instruction booklet not issued</i>	
Ways in which useful	%
Learn about general care and maintenance	5
Help with problems of day to day usage	4
Learn about mechanics of chair	4
Learn how to fold and unfold chair	3
Show how to negotiate kerbs and steps	2
Don't know, vague answers	3
Other ways	1
<i>Base</i>	<i>842</i>
<i>- cases where instruction booklet not issued</i>	

### 6.3 Repair and maintenance

We have already mentioned that, in answer to our questions on the ways in which the provision and maintenance of wheelchairs through the National Health Service could be improved, 4% of patients said that they would like to see a quicker repair service.

#### The condition and repair of wheelchairs

Since 13% of all wheelchairs in use were said to be in need of repair at the time of our interview, it appears that the wheelchair service is not entirely successful in keeping its wheelchairs in good working order. In terms of the total number of wheelchairs on issue to patients aged 18 years and over, this represents approximately 12,500 which were in need of repair.

The 13% of wheelchairs said to be in need of repair at the time of interview can be contrasted with the 36% which were said to have been repaired in the previous twelve months. Table 62 compares the repairs needed with those made in the previous twelve months. We also compared, for different models, the repairs needed with those made but found very little variation. Although the majority of the repairs carried out in the last twelve months were by people working for the wheelchair service (62% by official repairers and 8% by technical officers), some were carried out by the husband or wife of the patient (8%), others by another relative (11%) or by a friend (3%). In a few cases the repairs were carried out jointly by two or more people. Just occasionally the patients themselves carried out repairs.

The need for a quick and efficient repair service is shown in the answers to another question. Eight per cent of patients said that they had been without a

**Table 62** Comparison of repairs said to be needed with repairs said to have been done in the last year

Part of chair in need of repair or repaired	Rate per 1,000 wheelchairs in use†	Said to have been repaired in last year
Brakes	40	74
Wheels	26	79
Footrests, footboards, legrests	17	50
Tyres	15	123
Armrests	13	29
Upholstery, cushions	10	35
Steering, handrims	7	10
Folding mechanism	6	2
Backrests	-	18
Other parts	10	33
General overhaul	11	68

† Based on 967 non-powered NHS wheelchairs in use.

wheelchair because the one they were using (either their present chair or a previous chair) had been taken away to be repaired or replaced. Approximately a half of these patients had been forced to stay indoors (or worse still in bed). The majority of the remainder were not greatly inconvenienced because either they had been lent another chair as a temporary replacement or they had been without their chair for only a few hours.

It is gratifying to know that nearly all patients (94%) claimed to know what to do if their wheelchair needed repairing, for it will be seen from table 63 that there is a direct relationship between knowledge of the repair service and the state of repair of the wheelchair.

**Table 63** The proportions of chairs said to be in need of repair and to have been repaired in the last year analysed by knowledge of repair service

	Knows how to get chair repaired	Does not know how to get chair repaired
	%	%
Proportion said to be in need of repair	12	18
Proportion said to have been repaired in the last year	37	21
<i>Base - non-powered NHS wheelchairs in use</i>	<i>907</i>	<i>60</i>

Those who claimed to know what to do included 59% who said they would contact the Appliance Centre, 12% who said they would contact an official repairer and 11% who said they would contact the DHSS (without mentioning anybody in particular). A few patients (4%) said they would ask their relatives or friends to arrange for the wheelchair to be repaired. Not surprisingly, nearly a half (47%) of patients who were resident in an institution at the time of interview said they would ask a member of staff at that institution to arrange for a repair to be carried out.



## 6.4 Some comparisons between Appliance Centres

In table 64 we give some comparisons between the eight Appliance Centres selected for this inquiry. In considering these figures it should be remembered that the sample for Centre H is fairly small. We can, however, note some differences.

Centre H has the highest proportion of wheelchairs classified as permanently out of use (17%), despite the fact that it also has the lowest proportion of patients with more than one wheelchair (2%) and the highest average weekly use of wheelchairs by patients (44.2 hours).

Patients at Centre A appear to be the least satisfied with their wheelchairs, but perhaps this is because

Centre A also has the highest proportion of wheelchairs (18%) in need of repair.

It will be seen that patients at Centre F are the most satisfied with the wheelchair service. They are also the most likely to have visited an Appliance Centre or clinic.

There appears to be a distribution problem at Centres B and G, for we find that for both centres well over a quarter of wheelchairs took at least eight weeks to be delivered.

Finally, it is worth mentioning that although Centre D deals with by far the largest number of wheelchair patients (9,700), it nonetheless compares favourably with other centres.

Table 64 Some comparisons between Appliance Centres

The patients	Appliance Centre							
	A	B	C	D	E	F	G	H
Estimated number of wheelchair patients of all ages registered at Appliance Centre	4,600	4,500	4,400	9,700	6,300	3,300	5,000	2,000
	%	%	%	%	%	%	%	%
Proportion of patients who are female	60	66	66	59	66	62	76	69
Proportion of patients aged at least 80 years	13	16	15	21	15	18	21	18
Proportion of patients who have been wheelchair users for at least 10 years	28	30	31	32	27	23	27	25
<b>Wheelchair usage</b>	%	%	%	%	%	%	%	%
Proportion of patients with more than one wheelchair	4	13	6	7	13	15	10	2
Proportion of wheelchairs which were permanently out of use	9	8	7	9	10	11	8	17
Patients' average weekly use of wheelchairs (hrs)	36.2	36.2	33.7	37.0	32.2	37.5	38.5	44.2
<b>Patients' views on their wheelchairs</b>	%	%	%	%	%	%	%	%
Wheelchair was rated as -								
very satisfactory	37	46	46	36	53	63	58	54
satisfactory	52	42	44	58	38	33	32	37
not very satisfactory	11	12	10	6	9	4	10	9
Proportion of wheelchairs where patient was able to think of some bad points	70	80	74	70	71	77	63	73
Proportion of wheelchairs which could be made more suitable for person with same disability as patient	45	60	43	41	41	50	41	49
<b>Patients' views on the wheelchair service</b>	%	%	%	%	%	%	%	%
Wheelchair service was rated as -								
very satisfactory	42	43	43	42	47	67	59	53
satisfactory	47	51	50	57	46	27	34	44
not very satisfactory	11	6	7	1	7	6	7	3
Proportion of patients who suggested improvements in the wheelchair service	34	30	29	24	31	39	32	17
Proportion of prescriptions which included a visit by patients to Appliance Centre or clinic	8	11	8	16	13	20	4	3
Proportion of wheelchairs where delivery period was 8 weeks or more	18	31	22	17	20	18	30	19
Proportion of wheelchairs in need of repair	18	12	13	6	14	11	16	10
<i>Base - adult wheelchair patients</i>	124	126	125	151	128	131	131	62
<i>Base - non-powered NHS wheelchairs</i>	129	142	132	161	144	151	144	63



## 7 Other aids to mobility

### Walking aids

As well as having wheelchairs, some patients had other aids to mobility. These aids were of obvious interest because of the part they played in the mobility of our wheelchair patients. Consequently we asked a series of questions about these aids. We began by asking two questions about the possession and use of six different types of walking aids: sticks, walking frames, tripods, elbow crutches, shoulder crutches and calipers. The types of walking aids patients were most likely to have were walking sticks (46%) and walking frames (27%); none of the remaining aids were possessed by more than about one in seven patients. On the other hand, the replies to the question on use showed that, although many patients were equipped with various walking aids, a sizeable proportion never used the aids which they possessed; in particular, although about a half claimed to have a walking stick only about a third of patients said they used one. In other words, a little over a quarter of walking sticks were not used. Similarly, about a quarter of walking frames were not used (see table 65).

In general, we found that in the majority of cases where walking aids were no longer used this was attributed to a deterioration in the patient's physical condition; for example, of those who had walking sticks but did not use them, as many as a third said they now used a walking aid which provided more support and about a quarter said that their condition had deteriorated to such an extent that they were now confined to using a wheelchair. Similarly, of those who had walking frames but did not use them, over a half said they were now confined to using a wheelchair. Among other reasons given by patients for not using walking aids in their possession were a few where patients no longer felt safe using a particular aid and others where patients found a particular aid uncomfortable or difficult to use. In a small number of cases patients had stopped

using a particular aid because they had experienced a fall when trying to use it.

Taking into account all types of walking aids, we found that just under two-thirds (61%) of our adult wheelchair patients used a walking aid of one sort or another. This figure was made up of 36% who used a walking aid both indoors and outdoors, 22% who only used one indoors and 3% who only used one outdoors; thus the proportion who used a walking aid indoors (58%) exceeds the proportion who used a walking aid outdoors (39%) by 19%.

As mentioned earlier, on some occasions patients used walking aids instead of wheelchairs; thus we found that the average number of hours a week a wheelchair user spent in a wheelchair was only 22.4 among patients who used a walking aid compared with 58.4 among patients who did not. Table 66 gives further analysis by indoor and outdoor use.

### Other mobility aids

Besides asking about wheelchairs and walking aids we also asked a series of questions on other aids to mobility; in particular, we specifically asked about

Table 66 Average number of hours a week a patient spends in a wheelchair (November/December) analysed by the use of walking aids

	Average number of hours a week a patient spends in a wheelchair			Base†
	Indoors	Outdoors	Both	
Uses walking aid indoors	20.1	4.4	24.5	534
Uses walking aid outdoors	15.3	4.0	19.3	361
Does not use walking aid	53.6	4.8	58.4	359

† Base (919 adult wheelchair users) excludes patients who had not used a wheelchair for at least six months prior to the interview and who did not expect to use one in the future.

Table 65 Possession and use of walking aids

	Stick	Walking frame	Tripod	Elbow crutches	Shoulder crutches	Calipers
	%	%	%	%	%	%
Does not have this aid	54	73	90	90	96	86
Has this aid -						
uses indoors only	11	13	4	2	1	2
uses outdoors only	4	1	1	1	-	1
uses indoors and outdoors	19	6	3	4	3	9
does not use	12	7	2	3	-	2
Base (=100%) - adult wheelchair patients	978	978	978	978	978	978

ramps, hoists, lifts, handrails, toilet aids, bath seats, other washing aids and dressing aids. It is worth noting that none of these aids were possessed by more than two in five patients. However, in answer to a question on improvements patients would like to see in their accommodation, as many as 13% of those in private households mentioned ramps and another 5% mentioned handrails. Thus the evidence suggests that there could well be an unmet need. Home improvements in general are considered in greater detail in section 8.

Table 67 summarises the data we collected on the possession and use of other mobility aids. We found that in the majority of cases aids had been supplied free of charge. However, in a few cases part of the cost or the full cost fell upon the patient or his or her family; for instance, about a third of those with handrails, toilet aids or ramps said they had to contribute at least some of the cost. Most aids were in use; the proportion not in use never rose above a third.

Table 67 Possession and use of other mobility aids

Whether patient has this aid	Ramps	Hoists	Lifts	Hand-rails	Toilet aids	Bath seats	Other washing aids	Dressing aids
	%	%	%	%	%	%	%	%
Has aid	25	11	6	39	38	25	8	4
Does not have aid	75	89	94	61	62	75	92	96
<i>Base (=100%) - adult wheelchair patients</i>	978	978	978	978	978	978	978	978
Whether contributed towards cost	%	%	%	%	%	%	%	%
Paid full cost	8	1	1	11	8	7	3	1
Paid part cost	1	1	-	2	4	*	*	*
Did not contribute towards cost	16	9	5	26	26	18	5	3
<i>Base - adult wheelchair patients</i>	978	978	978	978	978	978	978	978
Whether uses this aid	%	%	%	%	%	%	%	%
Uses aid	23	8	6	34	34	19	8	3
Does not use aid	2	3	*	5	4	6	*	1
<i>Base adult wheelchair patients</i>	978	978	978	978	978	978	978	978

## 8 Housing and problems of mobility within the home

### Introduction

Because of their physical disabilities, some of our adult wheelchair patients need special housing. In this section we will examine how our patients' requirements are met and whether there is a need for the further provision of special housing.

### Institutions

We have already mentioned that as many as one in six of our patients live in institutions such as hospitals and old people's homes; we decided to exclude these from the analyses that follow, but their existence should not be overlooked. It follows that all tables are based on patients in private households.

### Type and age of accommodation

Table 68 shows that 15% of patients in private households live in purpose-built flats or bungalows for the disabled or elderly. This proportion increases to a maximum of about one in five among patients aged 70 years and over. Those not in special accommodation for the disabled or elderly are made up of 52% in houses, 20% in bungalows and 13% in flats or bedsitters. Thus, over a half live in accommodation with stairs (houses with more than one storey). Only 12% of houses with stairs have lifts installed. Stairs obviously cause problems of access.

Table 68 Type of accommodation occupied by adult wheelchair patients

	%
Purpose-built flat/bedsitter for old or disabled person	5
Purpose-built bungalow for old or disabled person	10
Other flat/bedsitter	13
Other bungalow	20
House	52
Base ( $\approx 100\%$ )	819
<i>- adult wheelchair patients in private households</i>	

Table 69 Age of accommodation analysed by whether purpose-built for the disabled or elderly

Date built	Type of accommodation		All types of accommodation
	Purpose-built for the disabled or elderly	Other	
	%	%	%
Before 1919	2	27	24
1919-1944 (Inter-war)	6	32	28
1945 or later (Post-war)	92	41	48
Base ( $\approx 100\%$ )	118	701	819
<i>- adult wheelchair patients in private households</i>			

We do not know how many patients have to climb stairs to get to their accommodation, but we do know that over three-quarters (76%) of all patients' flats are situated on the ground floor. The problems patients have when entering or leaving their homes in a wheelchair are discussed later in this section.

Nearly a half (48%) of adult wheelchair patients' accommodation was built since the last war, while just over a quarter (28%) was built between the wars. This leaves a quarter (24%) which was built before 1919.

Purpose-built accommodation for the disabled or elderly is, on average, a great deal newer than other types; 92% was built since the last war (see table 69).

### Tenure

Ownership or tenancy of accommodation is given for head of household. This means that if a patient pays a nominal rent for accommodation, in their son's or daughter's owner-occupied house, then the patient's accommodation would be classified as owner-occupied.

We found that just under a half (46%) of accommodation could be classified as owner-occupied. Among rented accommodation local authority tenancies formed the largest single group (39%). This leaves 11% rented from private landlords, 3% from employers, and 1% from charitable organisations.

The vast majority (85%) of purpose-built accommodation for the disabled or elderly was rented from local authorities, compared with only 31% of other types of accommodation.

### Household size and density of occupation

As mentioned earlier, more adult wheelchair patients live in one and two-person households (13% and 50%) than do members of the general population (6% and 22%).

Further analysis shows that the proportion who live alone increases to 36% among patients who live in purpose-built accommodation for the disabled or elderly.

As well as asking for the number of people in the patient's household, interviewers also asked for the number of rooms. In table 70 we give the average number of rooms and the density of occupation; both are compared with figures obtained from the 1971 Census of Population. We have excluded kitchens, bathrooms and WCs from our calculations.

Because the majority of our patients live in households which contain only one or two people, it comes as no surprise to find that, on average, their accommodation has a smaller-than-average number of rooms (2.86 compared with 4.91). However, it is worth noting that this may not be a bad thing because these people may have difficulty in looking after their homes; for example, among those responsible for doing the housework as many as 76% said they had difficulties.

The average number of persons per room for our patients is 0.82 compared with 0.58 for the general population.

**Table 70** A comparison of household size and density of occupation for adult wheelchair patients and the general population†

	Patients in private households	General population of England and Wales
Average number of persons in household	2.35	2.86
Average number of rooms in accommodation (excluding kitchens, bathrooms, WCs)	2.86	4.91
Density of occupation (persons per room)	0.82	0.58

† Based on people of all ages living in private households in England and Wales taken from the 1971 Census of Population.

### Inaccessibility

Three per cent of adult wheelchair patients in private households were confined to one room because of their disability. A further 30%, while not confined to one room, were unable to get to all of the rooms in their accommodation. It follows that only 67% had access to all their accommodation. However, it is worth noting that inaccessibility does not always cause great inconvenience; for example, most patients will not worry if they cannot enter a spare bedroom.

Returning to those who were confined to one room, we found that the majority were confined to their bedroom, but in a small number of cases (1%) they were prevented from using their bedroom because of their disability and usually this meant that they had to use their living room as a bedroom.

As would be expected, the more disabled a patient was, the more likely he or she was to be unable to get to at least some rooms.

The main factors preventing access to rooms were the inability to climb stairs (mentioned by 27% of patients in private households), doorways which were too narrow for wheelchairs (2%) and rooms which were too small for wheelchairs or other aids (4%). Other reasons included the inability to negotiate steps and to walk more than very short distances.

Separate analyses for different types of rooms show that a quarter of patients were unable to get to the WC

and 21% were unable to get to the bathroom. The proportion who could not get to the kitchen was 10%. As might perhaps be expected, inability to climb stairs, narrowness of doorways and size of room were important factors in preventing access to WCs and bathrooms (see table 71).

**Table 71** Factors preventing access to WC, bathroom and kitchen

	WC %	Bathroom %	Kitchen %
Proportion unable to gain access	25	21†	10
Factors preventing access			
Cannot climb stairs	17	14	2
Doorways too narrow for wheelchair	1	1	*
Room is too small	1	2	1
Cannot negotiate steps	*	2	2
Distance	1	1	2
Other factors	5	5	3
Base - adult wheelchair patients in private households	819	819	819

† Excludes a further 15% of patients who did not have a fixed bath in their accommodation.

If we compare purpose-built accommodation for the disabled or elderly with other types of accommodation, we find, not surprisingly, that the former cause fewer problems of access than the latter. It will be seen from table 72 that only 8% of patients in purpose-built accommodation for the disabled or elderly did not have full access to their accommodation. Furthermore, only a very small number said they could not get to the WC, bathroom or kitchen.

**Table 72** Access to accommodation analysed by whether purpose-built for the disabled or elderly

	Type of accommodation		
	Purpose-built for the disabled or elderly	Other	All types of accommodation
	%	%	%
Proportion confined to one room	2	3	3
Proportion not confined to one room, but who found some rooms inaccessible	6	35	30
Factors preventing access			
Cannot climb stairs	1	31	27
Doorways too narrow for wheelchair	3	3	2
Room is too small	1	4	4
Cannot negotiate steps	-	3	3
Distance	1	2	2
Other factors	2	1	1
Proportion unable to get to WC	8	28	25
Proportion unable to get to bathroom†	7	23	21
Proportion unable to get to kitchen	7	11	10
Base - adult wheelchair patients in private households	118	701	819

† Excludes a further 15% of patients who did not have a fixed bath in their accommodation.

As might perhaps be expected, patients who used a wheelchair indoors were more likely to have problems of access than were other patients. This is clearly shown in table 73. Whereas 41% of the latter group were able to use all their rooms, only 21% of the former group were able to do so. Furthermore, if patients used a wheelchair indoors, the proportions who were unable to get to the WC, bathroom or kitchen rose to 32%, 26% and 13% respectively.

It is worth noting that, even among those who were able to get to these rooms, some said their wheelchairs caused difficulties. We found that, among users of wheelchairs indoors, as many as 14% had difficulty in using their wheelchair when getting to the WC, 12% when getting to the bathroom and 9% when getting to the kitchen. In each case, the main difficulties encountered were narrow doorways and lack of space because of the dimensions of the room. The total proportion who claimed that doorways were too narrow for their wheelchairs was 4%, and the total who claimed that the rooms were too small to manoeuvre a wheelchair in was 8%.

Yet further evidence of the difficulties wheelchair patients have in using their wheelchairs indoors is given by the answers to another of our questions. Sixteen per cent of wheelchair users indoors said they sometimes got stuck in doorways, 8% in passageways and 8% at corners.

#### Entering or leaving accommodation when in a wheelchair

Users of wheelchairs outdoors were asked whether they had any difficulties with entering or leaving their accommodation; over three-quarters (83%) did not. The majority of those that did, mentioned difficulties with getting up and down steps (see table 74).

It may seem surprising that purpose-built accommodation for the disabled or elderly is not more satisfactory in this respect than other accommodation. The types of accommodation that stand out as causing most difficulties are flats and bedsitters (other than those built for the disabled and elderly). As many as a third (34%) of patients in flats or bedsitters said they had difficulties; in particular a quarter (23%) had problems with steps.

#### Adaptations to housing

We have already mentioned that, because of their physical disabilities, some adult wheelchair patients may require special accommodation in the form of purpose-built housing for the disabled and elderly, or ordinary housing which has been adapted to the needs of a disabled person. As stated earlier, as many as 15% of patients in private households live in purpose-built flats or bungalows for the disabled or elderly. Furthermore, in answer to a question on aids, we found that among those who did not live in purpose-built flats or bungalows for the disabled about a half (52%) said that handrails, ramps or lifts had been installed. Despite

**Table 73** Access to accommodation analysed by whether patient uses wheelchair indoors

	Patient uses wheelchair indoors %	Patient does not use wheelchair indoors %
Proportion confined to one room	2	3
Proportion not confined to one room, but who found some rooms inaccessible	41	21
Factors preventing access		
Cannot climb stairs	32	21
Doorways too narrow for wheelchair	4	-
Room is too small	8	1
Cannot negotiate steps	3	2
Distance	2	1
Other factors	1	*
Proportion unable to get to WC	32	19
Proportion unable to get to bathroom†	26	16
Proportion unable to get to kitchen	13	7
Base - adult wheelchair patients in private households	388	431

† Excludes a further 15% of patients who did not have a fixed bath in their accommodation.

**Table 74** Whether had difficulties with entering or leaving accommodation when in a wheelchair

	All types of accommodation %
Had difficulties	17
Did not have difficulties	83
Base (=100%)	659
- adult wheelchair patients in private households who used a wheelchair outdoors	
Type of difficulty	%
Steps	12
Ramps	3
Narrow doorways	2
Draught excluders	1
Other difficulties	3
Base	659
- adult wheelchair patients in private households who used a wheelchair outdoors	

this, there appears to be an unmet demand for (further) adaptations to housing; just under a half (46%) mentioned improvements that they would like to see in their accommodation which would help them as wheelchair users. This unmet demand remained at a consistently high level for all types of accommodation and did not differ between patients who used a wheelchair indoors and those who did not. The most frequent requests were for ramps (13%), wider doors (9%), the removal of steps (8%), bigger rooms (6%) and handrails (5%). Because the range of suggested improvements was large, we give in table 75 only those mentioned by at least 3% of patients. As many as a quarter of patients suggested more than one improvement.

**Table 75** Most frequently suggested improvements to accommodation

	All types of accommodation
	%
Patient did not suggest any improvements	46
Most frequently suggested improvements	
Ramps	13
Wider doors	9
Removal of steps	8
Bigger rooms (including WC/bathroom)	6
Handrails	5
Sliding doors	4
Downstairs WC	3
Installation of lifts	3
Accommodation on one level	3
<i>Base - adult wheelchair patients in private households</i>	819

### Reaching electric plugs and switches

We asked patients who used wheelchairs indoors whether they had any difficulties, however small, with reaching switches and electric plugs from a wheelchair. In each case about two out of every five had never tried; it is probable that a high proportion of these patients could not do so at all. Electric plugs caused most difficulty; as many as 11% found plugs were too low and a further 11%, while not complaining of the height, did have other difficulties. Sixteen per cent had difficulties with switches; they included 9% who said that switches were placed too high (see table 76).

Further analysis shows, not surprisingly, that the patients who had most difficulty with reaching switches

**Table 76** Whether had difficulties with reaching switches and electric plugs

	Reaching switches	Reaching electric plugs
	%	%
Had difficulty	16	22
Did not have difficulty	45	30
Had never tried	39	48
<i>Base (~100%) - adult wheelchair patients in private households who use a wheelchair indoors</i>	388	388
Type of difficulty	%	%
Too low	-	11
Too high	9	2
Patient's physical condition	5	5
Other	2	4
	388	388
<i>Base - adult wheelchair patients in private households who use a wheelchair indoors</i>		

and electric plugs were those who had most difficulty with bending their backs.

### Sitting at a table

We also asked about difficulties patients had with sitting at a table when in a wheelchair; 8% of patients who use a wheelchair indoors mentioned difficulties. On the other hand as many as 29% had never tried. Difficulties were caused both by the height of the table (4%) and with leg-rests (1%). Other difficulties were mentioned by 4%. Some patients (1%) mentioned more than one difficulty.



## 9 Mobility outside the home

### Introduction

We have already seen that as many as three-quarters of adult wheelchair patients use their wheelchairs outdoors. We will now consider these patients in more detail. Nearly all of them (95%) said they were pushed by an attendant compared with only a half (54%) of indoor users. This was despite the fact that as many as two-thirds of chairs in use outdoors were designed to be hand-propelled. As mentioned earlier (see section 5.3), the general lack of use of handrims is mainly caused by disability; however, outdoor users also give as reasons the length of journey, the hilly landscape and the large number of kerbs or steps to negotiate (mentioned in 11%, 9% and 5% respectively of cases where the handrims were not used).

### Occasions used

We asked patients to tell us about the occasions they used their wheelchairs outdoors. The range of answers was large and has already been given in table 30. Here we will only concern ourselves with the use of wheelchairs when making visits to friends, going shopping and making visits to theatres and cinemas.

It will be seen from table 77 that approximately two-thirds (64%) said they used their chairs to visit friends

Table 77 Travelling difficulties and access problems when visiting friends, going to shops and visiting theatres or cinemas

Whether does activity	Visiting friends	Going shopping	Visiting theatre/cinema
	%	%	%
Does activity using wheelchair	64	59	17
Does activity without using wheelchair	8	4	7
Does not do activity	28	37	76
<i>Base (=100%) - adult wheelchair patients who use a wheelchair outdoors</i>	813	813	813
Proportion who don't take part because of travelling difficulties (distance, landscape, busy roads)	%	%	%
	2	8	10
Proportion who don't take part because of problems of access for wheelchair users (steps, doorways, gangways)	3	2	10

and that a further 8% visited friends but did not take their wheelchairs. This only left a little over a quarter (28%) who did not visit friends at all. A slightly higher proportion (37%) said they never went shopping. It is noteworthy that as many as three-quarters (76%) never visited theatres or cinemas.

Analysis of the reasons shows that neither travelling difficulties (distance, landscape, busy roads) nor access problems (steps, doorways, gangways) were ever mentioned by more than one in ten. It is worth noting that theatres and cinemas are the most likely to cause access problems for the wheelchair user.

### Transport

Patients were also asked to say whether they used their wheelchairs when travelling by bus, train or car. From table 78 we see that over three-quarters (79%) travelled by car, while much smaller proportions (14% and 10% respectively) travelled by train or bus. In most cases patients travelled with their wheelchairs.

Only in a minority of cases did patients blame either their wheelchairs or access problems for preventing them from travelling by a particular mode of transport.

Table 78 Use of wheelchairs when travelling by bus, train or car

Whether travels by mode of transport	Bus	Train	Car
	%	%	%
Does travel and takes chair	9	12	77
Does travel but does not take chair	1	2	2
Does not travel	90	86	21
<i>Base (=100%) - adult wheelchair patients who use a wheelchair outdoors</i>	813	813	813
Proportion who don't travel by this mode of transport because use other mode (usually car)	%	%	%
	35	29	-
Proportion who don't travel by this mode of transport because chair is unsuitable (too heavy, cumbersome, does not fold)	17	6	3
Proportion who don't travel by this mode of transport because of problems of access for wheelchair users (steps, doorways, gangways)	12	4	-

## 10 Patients who are also drivers

### Introduction

Twelve per cent of our sample of adult wheelchair patients had invalid three-wheeler cars (8%) or cars adapted for use by disabled drivers (4%). Since vehicles are provided for some patients because they are needed for work, it is not surprising to find that as many as two-thirds of patients with jobs had cars. We go on to examine the use made of the cars, both in terms of frequency and occasions used.

### Frequency of use

Patients with cars were shown five categories of frequency of use and were asked to name the one that applied to them. It will be seen from table 79 that over a half (58%) used their cars at least once a day and another third (32%) used their cars less than once a day but at least once a week. Six per cent used their cars less often. This leaves 3% who said they never used their vehicles at all nowadays. We did not ask these patients to explain why they did not use their cars.

It is worth noting that the proportion who used their cars daily rises to 88% among those who had jobs.

Table 79 Frequency of use of invalid three-wheeler cars and cars adapted for use by disabled drivers

	%
Never used	3
Less than once a month	2
Once a month, but less than once a week	4
Once a week, but less than once a day	32
Once a day or more often	58

Base (=100%) 120

- adult wheelchair patients who had cars

Table 80 Occasions on which invalid three-wheeler cars and cars adapted for use by disabled drivers are used

	%
Visiting relatives and friends	82
Going shopping	76
Driving to and from work	28
Pleasure trips to the countryside	23
Attending sporting activities	9
Going to disabled persons' club	8
Visiting doctor or hospital	7
Going for a drink	7
Going on holiday	7
Doing welfare work	5
Driving children to school	2
Other occasions	12

Base - adult wheelchair patients who drive cars 116

Note: Many patients mentioned occasions of more than one type.

### Occasions used

Drivers mentioned a wide range of occasions on which they used their cars. These are given in table 80.

By far the most frequently mentioned, both given by over three-quarters of drivers, were visiting relatives and friends (82%) and going shopping (76%). Other occasions mentioned quite often were driving to and from work (28%) and pleasure trips to the countryside (23%).

Further analysis shows that most drivers with jobs drove to and from work (88%).

### The orange car badge scheme

The orange car badge scheme, like its predecessor the yellow car badge scheme, which it replaced in most local authority areas in 1971, is designed to help disabled drivers overcome some of their parking problems. It has remained virtually unchanged since its introduction except for a few minor changes in June 1975<sup>1</sup>. Local authorities are allowed to charge fees of up to £1 for the issue of an orange badge.

Disabled drivers are eligible for orange badges if:

- they either drive motor vehicles supplied by the Department of Health and Social Security or receive car conversion grants,
- they drive motor vehicles which are eligible for exemption from any duty under the Vehicle (Excise) Act 1971,
- they have permanent or substantial disability which cause considerable difficulty in walking.

Disabled passengers are eligible for orange badges if:

- they are so incapacitated as to experience considerable difficulty in walking and are in need of constant attention,
- they are dependent on the use of a wheelchair outside the home.

The orange car badge, when displayed, exempts the holder from parking charges, time limits at parking meters and limited waiting only. The local authority has the discretion to give further concessions if they wish.

Knowledge of the scheme appeared to be widespread; nearly three-quarters (73%) of drivers said they had

<sup>1</sup> Details of these changes can be found in the Department of Environment's Circular number 23/75.

heard of it and the majority (57%) said they belonged to it. Thus only 16% of drivers said they knew about the scheme but did not belong to it; of these, nearly a half said they did not belong to the scheme because people recognised disabled drivers from the types of cars they drove.

#### Transferring between wheelchair and car

We asked drivers whether they had any difficulties in getting from their chairs into their cars. Only one in six (17%) said they did. Included in this figure were 4% who complained that the car seat was too low. Complaints about the car seat being too low came entirely from drivers of three-wheeler cars; these vehicles do not have especially low seats. Other difficulties included a few cases where patients had problems with car doors being too narrow.

Table 81 Whether had difficulties with transferring between wheelchair and car analysed by type of car

	Invalid three-wheeler	Car adapted for disabled driver	All cars
	%	%	%
Had no difficulties	82	85	83
Did have difficulties	18	15	17
<i>Base (=100%)</i>	<i>76</i>	<i>40</i>	<i>116</i>
<i>- adult wheelchair patients who drive cars</i>			
Type of difficulty	%	%	%
Car seat is too low	5	-	4
Other difficulties	13	15	13
<i>Base</i>	<i>76</i>	<i>40</i>	<i>116</i>
<i>- adult wheelchair patients who drive cars</i>			

#### Stowing wheelchairs in cars

The great majority of drivers (85%) said that they stowed their wheelchairs in their vehicles. Most of

Table 82 Whether had difficulties with stowing wheelchair in car analysed by type of car

	Invalid three-wheeler	Car adapted for disabled driver	All cars
	%	%	%
Chair not stowed in car	20	5	15
Chair stowed in car - without difficulty	33	36	34
with difficulty	47	59	51
<i>Base (=100%)</i>	<i>76</i>	<i>40</i>	<i>116</i>
<i>- adult wheelchair patients who drive cars</i>			
Type of difficulty	%	%	%
Lack of space inside car	12	5	9
Lack of space in boot	9	2	7
Cannot lift chair because of disability	-	18	6
Chair is too heavy to lift	4	8	5
Chair cannot be lifted for other reasons	8	-	5
Chair moves around inside car	4	5	4
Chair restricts drivers side view	1	-	1
Other difficulties	16	8	13
<i>Base</i>	<i>76</i>	<i>40</i>	<i>116</i>
<i>- adult wheelchair patients who drive cars</i>			

these said they had problems with stowage; only 34% did not have any problems.

The majority of difficulties were caused by design problems; for example, 9% mentioned lack of space inside the car and 7% lack of space in the boot. On the other hand, some difficulties were the effects of disability; in particular, 6% said they did not have the strength to lift their wheelchairs. Table 82 compares invalid three-wheeler cars with cars adapted for disabled drivers.

## Appendix A

### Disabilities diagnosed when wheelchairs were prescribed

Table 83 Disability diagnosed when wheelchair was prescribed

	%
<b>Arthritis and related conditions</b>	
Osteoarthritis	10
Rheumatoid arthritis	11
Arthritis (type not given)	3
Cervical spondylosis	1
Ankylosing spondylosis	*
	25
<b>Cerebro-vascular diseases</b>	
Hemiplegia or hemiparesis	12
Cardiac disease	4
Cerebro-vascular accident (outcome unspecified)	1
	16
<b>Organic nervous diseases and resulting effects</b>	
Multiple sclerosis	9
Other organic nervous diseases	3
	12
<b>Amputations</b>	
Double above knee	1
Double below knee	*
Single above knee	3
Single below knee	1
Single arm	*
Others	2
	7
<b>Paraplegia and tetraplegia</b>	
Paraplegia (traumatic)	3
Quadriplegia or tetraplegia (traumatic)	1
Monoplegia	*
Triplegia	*
	5
<b>Cerebral palsy</b>	9
<b>Poliomyelitis and resulting effects</b>	4
<b>Other disabilities</b>	
Trauma of any cause not mentioned elsewhere	2
Parkinson's disease	2
Muscular dystrophy	2
Bone disease	1
Peripheral vascular disease (without amputations)	1
Spina bifida	3
Friedreich's ataxia	*
Respiratory disease	1
Senility	*
Psychiatric disorders	*
Others	6
	17
<b>Disability not recorded</b>	4

Base - wheelchair patients of all ages 1955

Note: The percentages add to more than 100 because some patients had more than one disability.

## Appendix B

### Height and weight at time of prescription

Table 84 Height in centimetres analysed by sex and age

Height (in centimetres)	Sex		Age in years (at time of prescription†)										All patients
	Male	Female	Up to 9	10-17	18-29	30-39	40-49	50-59	60-69	70-79	80 & over		
	%	%	%	%	%	%	%	%	%	%	%	%	
Up to 119	7	5	54	6	-	-	1	1	-	-	-	6	
120 - 139	4	3	12	34	4	6	1	1	1	1	-	4	
140 - 149	1	4	-	17	2	5	1	3	1	5	4	3	
150 - 154	3	13	-	9	8	8	5	9	9	12	25	9	
155 - 159	3	18	*	5	14	11	14	15	17	14	22	12	
160 - 164	8	20	-	8	13	11	16	22	22	20	18	16	
165 - 169	12	13	-	2	14	11	20	18	14	18	10	12	
170 - 174	19	5	-	2	10	20	16	11	13	12	9	10	
175 - 179	12	3	-	-	9	11	14	7	10	6	3	6	
180 and over	10	*	-	1	11	6	8	4	6	3	*	4	
Not known	21	16	34	16	15	11	4	9	7	9	9	18	
Base (=100%)	747	1222	182	86	79	94	154	234	363	376	184	1975	
- wheelchair patients of all ages													
Average height (in centimetres)	161.8	155.0	102.2	140.6	164.6	163.6	166.3	163.1	164.7	162.1	159.2	157.4	
Standard deviation	23.9	17.6	17.0	16.8	13.6	13.5	11.0	11.6	9.3	9.3	7.7	20.4	

† Because the height and weight were recorded at the time the wheelchair was prescribed, we have also used the age at that time.

Table 85 Height in inches analysed by sex and age

Height (in inches)	Sex		Age in years (at time of prescription†)										All patients
	Male	Female	Up to 9	10-17	18-29	30-39	40-49	50-59	60-69	70-79	80 & over		
	%	%	%	%	%	%	%	%	%	%	%	%	
Up to 47	8	5	58	9	-	-	1	1	-	-	-	6	
48 - 53	2	2	7	22	4	2	-	*	*	*	-	2	
54 - 59	2	6	1	28	2	10	3	3	1	7	5	5	
60 - 61	3	16	-	8	13	11	7	12	13	14	29	11	
62 - 63	6	23	*	7	10	12	21	20	23	22	26	17	
64 - 65	9	17	-	6	14	17	16	18	18	18	14	14	
66 - 67	16	9	-	1	15	10	17	20	14	16	10	12	
68 - 69	16	4	-	2	11	15	12	8	13	9	4	8	
70 - 71	11	2	-	1	8	7	15	6	7	3	3	5	
72 and over	6	-	-	-	8	6	4	3	4	2	*	2	
Not known	21	16	34	16	15	10	4	9	7	9	9	18	
Base (=100%) - wheelchair patients of all ages	747	1222	182	86	79	94	154	234	363	376	184	1975	
Average height (in inches)	63.7	61.0	40.2	55.4	64.8	64.4	65.5	64.2	64.8	63.8	62.7	62.0	
Standard deviation	9.4	6.9	6.7	6.6	5.4	5.3	4.3	4.6	3.6	3.7	3.0	8.0	

† Because the height and weight were recorded at the time the wheelchair was prescribed, we have also used the age at that time.

Table 86 Weight in kilograms analysed by sex and age

Weight (in kilograms)	Sex		Age in years (at time of prescription†)										All patients
	Male	Female	Up to 9	10-17	18-29	30-39	40-49	50-59	60-69	70-79	80 & over		
	%	%	%	%	%	%	%	%	%	%	%	%	
Up to 29	10	6	65	24	-	1	-	-	-	*	-	8	
30 - 39	3	3	2	23	4	5	1	2	1	2	3	3	
40 - 49	4	11	*	15	11	8	6	10	6	10	13	8	
50 - 59	12	25	*	12	29	35	28	24	23	23	24	20	
60 - 69	20	20	*	4	30	21	21	27	24	28	26	20	
70 - 79	18	12	-	4	11	12	24	18	21	16	16	14	
80 - 89	11	6	1	-	4	3	10	10	14	11	7	8	
90 and over	3	2	-	1	-	4	4	3	5	3	3	3	
Not known	19	15	31	17	11	11	6	6	6	7	8	16	
Base (=100%) - wheelchair patients of all ages	747	1222	182	86	79	94	154	234	363	376	184	1975	
Average weight (in kilograms)	61.2	58.4	19.5	39.5	59.2	60.3	65.9	63.7	67.0	63.7	62.4	59.4	
Standard deviation	21.1	17.6	11.6	16.1	11.2	16.6	14.8	13.1	13.8	13.9	14.2	19.0	

† Because the height and weight were recorded at the time the wheelchair was prescribed, we have also used the age at that time.

Table 87 Weight in pounds analysed by sex and age

Weight (in pounds)	Sex		Age in years (at time of prescription†)										All patients
	Male	Female	Up to 9	10-17	18-29	30-39	40-49	50-59	60-69	70-79	80 & over		
	%	%	%	%	%	%	%	%	%	%	%	%	
Up to 59	9	6	64	19	-	-	-	-	-	-	-	7	
60 - 79	3	2	2	22	1	4	1	1	*	2	2	2	
80 - 99	3	7	2	17	11	5	4	5	5	6	6	6	
100 - 119	7	17	-	13	18	21	17	18	13	17	18	13	
120 - 139	10	18	*	6	22	27	19	19	18	17	21	15	
140 - 159	24	20	*	4	26	20	27	29	27	28	28	21	
160 - 179	13	8	-	1	9	6	15	11	15	11	9	10	
180 - 199	5	8	1	-	2	3	7	8	11	9	5	6	
200 and over	3	2	-	1	-	3	4	3	5	3	3	3	
Not known	20	15	31	17	11	11	6	6	6	7	8	17	
Base (=100%) - wheelchair patients of all ages	747	1222	182	86	79	94	154	234	363	376	184	1975	
Average weight (in pounds)	134.9	128.6	43.1	86.6	130.4	132.9	145.2	140.4	147.7	140.4	137.5	130.8	
Standard deviation	46.5	38.7	25.5	35.5	24.6	36.5	32.5	28.9	30.4	30.6	31.2	41.9	

† Because the height and weight were recorded at the time the wheelchair was prescribed, we have also used the age at that time.



Table 88 Weight in kilograms analysed by height in centimetres

Weight (at time of prescription) (in kilograms)	Height in centimetres (at time of prescription)											All patients	Average height (in centimetres)	Standard deviation
	Up to 119	120-139	140-149	150-154	155-159	160-164	165-169	170-174	175-179	180 & over				
	%	%	%	%	%	%	%	%	%	%				
Up to 29	92	42	5	1	-	1	-	-	-	-	8	105.5	19.6	
30 - 39	1	29	14	3	4	1	1	-	1	-	3	144.5	14.6	
40 - 49	1	9	35	19	14	9	5	6	2	-	8	155.8	9.7	
50 - 59	1	9	28	31	36	29	30	14	14	4	20	160.0	9.2	
60 - 69	2	-	6	22	23	32	30	35	26	17	20	164.1	9.4	
70 - 79	-	3	5	14	12	14	22	30	25	40	14	167.3	9.9	
80 - 89	1	1	2	6	8	9	8	12	23	29	8	167.5	12.8	
90 and over	-	-	2	2	2	4	2	3	8	9	3	168.3	10.7	
Not known	2	7	3	2	1	1	2	*	1	1	16	-	-	
Base (=100%) - wheelchair patients of all ages	111	69	64	177	245	303	246	197	126	76	1975	157.4	20.4	
Average weight (in kilograms)	18.9	33.5	49.2	58.9	59.7	63.3	64.5	67.8	72.2	77.0	59.4			
Standard deviation	11.1	13.7	14.0	13.7	12.7	13.7	11.8	11.7	14.0	12.1	19.0			

Table 89 Weight in pounds analysed by height in feet and inches

Weight (at time of prescription) (in pounds)	Height in feet and inches (at time of prescription)											All patients	Average height in inches	Standard deviation
	Up to 3'11"	4' to 4'5"	4'6" to 4'11"	5' to 5'1"	5'2" to 5'3"	5'4" to 5'5"	5'6" to 5'7"	5'8" to 5'9"	5'10" to 5'11"	6' and over				
	%	%	%	%	%	%	%	%	%	%				
Up to 59	89	44	2	-	-	-	-	-	-	7	40.7	7.0		
60 - 79	4	21	14	2	2	1	*	-	1	2	55.6	6.7		
80 - 99	1	19	27	13	8	4	2	1	-	6	59.9	4.4		
100 - 119	-	5	24	29	20	19	12	11	7	13	62.7	3.6		
120 - 139	2	2	8	20	27	25	20	13	8	4	63.5	3.7		
140 - 159	1	-	12	22	25	28	40	39	37	23	65.1	3.8		
160 - 179	-	2	5	6	9	11	16	21	22	26	65.9	3.8		
180 - 199	1	2	2	5	6	7	6	12	16	36	66.0	5.4		
200 and over	-	-	1	2	2	3	2	4	8	11	3	66.2	4.2	
Not known	2	5	5	1	1	2	2	1	1	17	-	-		
Base (=100%)	121	42	95	221	324	272	233	159	100	47	1975			
- wheelchair patients of all ages														
Average weight in pounds	42.2	73.8	109.8	128.3	134.6	141.1	145.0	153.2	160.9	175.4	130.8			
Standard deviation	23.6	31.5	34.2	29.1	28.6	29.3	25.8	25.6	30.7	26.3	41.9			

## Appendix C

### Standard features of National Health Service wheelchairs

Table 90 Standard features of National Health Service wheelchairs

Description of standard features	Self-propelling wheelchairs				Car chairs		Pushchair
	Model				Model		Model
	8G	8GJ	8L	8BL	9	9L	13
Material of seat and back	PVC coated canvas				PVC coated canvas		PVC covered cushions
Armrests	Padded, detachable, enclosed				Padded, fixed, enclosed		Padded, open, hinged
Footrests	Divided, hinged, adjustable				Divided, hinged, adjustable, detachable		Folding footboard
Rear wheels	22" diameter propelling wheels, pneumatic tyres				11" diam. solid tyres	12½" diam. pneumatic tyres	11" diam. solid tyres
Front wheels	Two castors, solid tyres, 7", 7½", 5" diameters respectively				Two castors, solid tyres, 5", 7" diam. respectively		11" diam. solid tyres
Parking brakes	Separate left and right 'push on' (8G; 8GJ; 8L), 'pull on' (8BL)				Separate left and right, 'pull on'		'Pull on' handbrake, footbrake
Other features					Folding backrest		Folding backrest

## Appendix D

### Dimensions of National Health Service wheelchairs

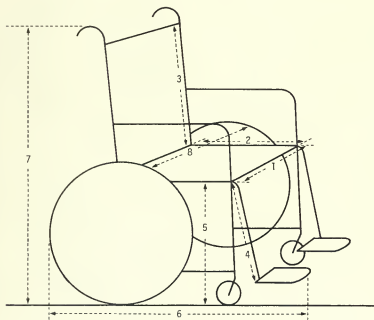
Table 91 Dimensions of National Health Service wheelchairs

Dimensions† (in inches)	Self-propelling wheelchairs				Car chairs		Pushchair
	Model 8G	8GJ	8L	8BL	Model 9	9L	Model 13
Seat width	17	15	17	16	17	17	18
Seat depth	17	16	17	16	17	17	19
Height and backrest	17	17	17½	18	17	17	22
Backrest angle (degrees)	15°	15°	15°	10°	10°	15°	Adjustable
Seat to footrest	13-17	13-17	13-17	12-17	13-17	13-17	12
Seat to ground	19	19	19½	19	19	19	20
Overall length	41	40	41	37	30	30½	61
Overall height	38	38	37½	37	38	38	42
Overall width (open)	25	23	24½	23	25	25½	27
Overall width (folded)	10	10	10	10	10	11	27
Weight (in pounds)	50	50	40	37	45	34	64

† Where considered necessary, dimensions are illustrated and defined in the key figure on the following page.

Figure 2 Dimensions of chairs (see table 91)

KEY TO DIMENSIONS



KEY:

- |                       |                   |
|-----------------------|-------------------|
| 1. Seat width         | 5. Seat to ground |
| 2. Seat depth         | 6. Overall length |
| 3. Height of backrest | 7. Overall height |
| 4. Seat to footrest   | 8. Overall width  |

## Appendix E

### Patients with invalid three-wheeler cars

Table 92 Sex and age of drivers of invalid three-wheeler cars

	%
Sex	
Male	70
Female	29
Not stated	1
Age in years	
17 - 29	12
30 - 39	8
40 - 49	13
50 - 59	24
60 - 69	23
70 - 79	10
80 and over	1
Not known	8
Median age	55 yrs 4 mths
Base (=100%) - drivers of invalid three-wheeler cars	261

As described in the introduction we obtained, as a by-product of our sampling procedure, some data on a small sample of all those with invalid three-wheeler cars regardless of whether or not they had wheelchairs. Tables 92 and 93 show the sex, age and disabilities of drivers of invalid three-wheeler cars.

Table 93 Disabilities of drivers of invalid three-wheeler cars

	%
Amputations	13
Poliomyelitis and resulting effects	17
Arthritis and related conditions	14
Organic nervous diseases and resulting effects	14
Cerebro-vascular disease	7
Cerebral palsy	10
Paraplegia and tetraplegia	5
Other disabilities	17
Not known	3
Base - drivers of invalid three wheeler cars	261

# Appendix F

## The questionnaire

- 2 -

### WHEELCHAIRS AND THEIR USERS

SSI027

Interviewer's name ..... Serial number

Interviewer's number

Date of interview ...../...../1973 Length of interview ..... minutes

Is area, within one mile of informant's residence, hilly? Yes No

Interview with Informant alone  
Informant with someone present  
Informant with help of proxy  
Proxy only  
Proxy only, with informant present

IF PROXY (CODES 3-5) Relationship to informant  
1 Husband/wife  
2 Other relative  
3 Friend  
4 Nursing staff  
5 Other (specify)

#### HOUSEHOLD CLASSIFICATION

Relationship	Married	Age	Sex	Marital Status	Employment Status	Mobility	Wheelchair
Informant	Married	Age	Sex	Full Part Unemp	Other	Full	Other
1	2	3	4	5	6	7	8
1	2	3	4	5	6	7	8
2	3	4	5	6	7	8	9
3	4	5	6	7	8	9	0
4	5	6	7	8	9	0	1
5	6	7	8	9	0	1	2
6	7	8	9	0	1	2	3
7	8	9	0	1	2	3	4
8	9	0	1	2	3	4	5
9	0	1	2	3	4	5	6
0	1	2	3	4	5	6	7
1	2	3	4	5	6	7	8
2	3	4	5	6	7	8	9
3	4	5	6	7	8	9	0
4	5	6	7	8	9	0	1
5	6	7	8	9	0	1	2
6	7	8	9	0	1	2	3
7	8	9	0	1	2	3	4
8	9	0	1	2	3	4	5
9	0	1	2	3	4	5	6
0	1	2	3	4	5	6	7
1	2	3	4	5	6	7	8
2	3	4	5	6	7	8	9
3	4	5	6	7	8	9	0
4	5	6	7	8	9	0	1
5	6	7	8	9	0	1	2
6	7	8	9	0	1	2	3
7	8	9	0	1	2	3	4
8	9	0	1	2	3	4	5
9	0	1	2	3	4	5	6
0	1	2	3	4	5	6	7
1	2	3	4	5	6	7	8
2	3	4	5	6	7	8	9
3	4	5	6	7	8	9	0
4	5	6	7	8	9	0	1
5	6	7	8	9	0	1	2
6	7	8	9	0	1	2	3
7	8	9	0	1	2	3	4
8	9	0	1	2	3	4	5
9	0	1	2	3	4	5	6
0	1	2	3	4	5	6	7
1	2	3	4	5	6	7	8
2	3	4	5	6	7	8	9
3	4	5	6	7	8	9	0
4	5	6	7	8	9	0	1
5	6	7	8	9	0	1	2
6	7	8	9	0	1	2	3
7	8	9	0	1	2	3	4
8	9	0	1	2	3	4	5
9	0	1	2	3	4	5	6
0	1	2	3	4	5	6	7
1	2	3	4	5	6	7	8
2	3	4	5	6	7	8	9
3	4	5	6	7	8	9	0
4	5	6	7	8	9	0	1
5	6	7	8	9	0	1	2
6	7	8	9	0	1	2	3
7	8	9	0	1	2	3	4
8	9	0	1	2	3	4	5
9	0	1	2	3	4	5	6
0	1	2	3	4	5	6	7
1	2	3	4	5	6	7	8
2	3	4	5	6	7	8	9
3	4	5	6	7	8	9	0
4	5	6	7	8	9	0	1
5	6	7	8	9	0	1	2
6	7	8	9	0	1	2	3
7	8	9	0	1	2	3	4
8	9	0	1	2	3	4	5
9	0	1	2	3	4	5	6
0	1	2	3	4	5	6	7
1	2	3	4	5	6	7	8
2	3	4	5	6	7	8	9
3	4	5	6	7	8	9	0
4	5	6	7	8	9	0	1
5	6	7	8	9	0	1	2
6	7	8	9	0	1	2	3
7	8	9	0	1	2	3	4
8	9	0	1	2	3	4	5
9	0	1	2	3	4	5	6
0	1	2	3	4	5	6	7
1	2	3	4	5	6	7	8
2	3	4	5	6	7	8	9
3	4	5	6	7	8	9	0
4	5	6	7	8	9	0	1
5	6	7	8	9	0	1	2
6	7	8	9	0	1	2	3
7	8	9	0	1	2	3	4
8	9	0	1	2	3	4	5
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0	1	2	3	4	5	6	7
1	2	3	4	5	6	7	8
2	3	4	5	6	7	8	9
3	4	5	6	7	8	9	0
4	5	6	7	8	9	0	1
5	6	7	8	9	0	1	2
6	7	8	9	0	1	2	3
7	8	9	0	1	2	3	4
8	9	0	1	2	3	4	5
9	0	1	2	3	4	5	6
0	1	2	3	4	5	6	7
1	2	3	4	5	6	7	8
2	3	4	5	6	7	8	9
3	4	5	6	7	8	9	0
4	5	6	7	8	9	0	1
5	6	7	8	9	0	1	2
6	7	8	9	0	1	2	3
7	8	9	0	1	2	3	4
8	9	0	1	2	3	4	5
9	0	1	2	3	4	5	6
0	1	2	3	4	5	6	7
1	2	3	4	5	6	7	8
2	3	4	5	6	7	8	9
3	4	5	6	7	8	9	0
4	5	6	7	8	9	0	1
5	6	7	8	9	0	1	2
6	7	8	9	0	1	2	3
7	8	9	0	1	2	3	4
8	9	0	1	2	3	4	5
9	0	1	2	3	4	5	6
0	1	2	3	4	5	6	7
1	2	3	4	5	6	7	8
2	3	4	5	6	7	8	9
3	4	5	6	7	8	9	0
4	5	6	7	8	9	0	1
5	6	7	8	9	0	1	2
6	7	8	9	0	1	2	3
7	8	9	0	1	2	3	4
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1	2	3	4	5	6	7	8
2	3	4	5	6	7	8	9
3	4	5	6	7	8	9	0
4	5	6	7	8	9	0	1
5	6	7	8	9	0	1	2
6	7	8	9	0	1	2	3
7	8	9	0	1	2	3	4
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1	2	3	4	5	6	7	8
2	3	4	5	6	7	8	9
3	4	5	6	7	8	9	0
4	5	6	7	8	9	0	1
5	6	7	8	9	0	1	2
6	7	8	9	0	1	2	3
7	8	9	0	1	2	3	4
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3	4	5	6	7	8	9	0
4	5	6	7	8	9	0	1
5	6	7	8	9	0	1	2
6	7	8	9	0	1	2	3
7	8	9	0	1	2	3	4
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1	2	3	4	5	6	7	8
2	3	4	5	6	7	8	9
3	4	5	6	7	8	9	0
4	5	6	7	8	9	0	1
5	6	7	8	9	0	1	2
6	7	8	9	0	1	2	3
7	8	9	0	1	2	3	4
8	9	0	1	2	3	4	5
9	0	1	2	3	4	5	6
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1	2	3	4	5	6	7	8
2	3	4	5	6	7	8	9
3	4	5	6	7	8	9	0
4	5	6	7	8	9	0	1
5	6	7	8	9	0	1	2
6	7	8	9	0	1	2	3
7	8	9	0	1	2	3	4
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1	2	3	4	5	6	7	8
2	3	4	5	6	7	8	9
3	4	5	6	7	8	9	0
4	5	6	7	8	9	0	1
5	6	7	8	9	0	1	2
6	7	8	9	0	1	2	3
7	8	9	0	1	2	3	4
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9	0	1	2	3	4	5	6
0	1	2	3	4	5	6	7
1	2	3	4	5	6	7	8
2	3	4	5	6	7	8	9
3	4	5	6	7	8	9	0
4	5	6	7	8	9	0	1
5	6	7	8	9	0	1	2
6	7	8	9	0	1	2	3
7	8	9	0	1	2	3	4
8	9	0	1	2	3	4	5
9	0	1	2	3	4	5	6
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1	2	3	4	5	6	7	8
2	3	4	5	6	7	8	9
3	4	5	6	7	8	9	0
4	5	6	7	8	9	0	1
5	6	7	8	9	0	1	2
6	7	8	9	0	1	2	3
7	8	9	0	1	2	3	4
8	9	0	1	2	3	4	5
9	0	1	2	3	4	5	6
0	1	2	3	4	5	6	7
1	2	3	4	5	6	7	8
2	3	4	5	6	7	8	9
3	4	5	6	7	8	9	0
4	5	6	7	8	9	0	1
5	6	7	8	9	0	1	2

4. Does your disability physically affect you in any other ways?

No  
Other (specify) 1 2

5. Has your condition improved, got worse, or remained the same, since you have been using a wheelchair?

Improved 1  
Got worse 2  
Remained the same 3

6. Some people's disabilities prevent them doing everyday tasks.

May I just check?  
Do you need help when ..... or can you  
always do it unaided?

IF NEEDS HELP PROBE WHETHER SOME OR ALL OF THE TIME  
REPEAT QUESTION FOR EACH TASK

TASK	Unaided help	Sometimes help	No help
(a) Getting in and out of bed	1	2	3
(b) Dressing and undressing	4	5	6
(c) Getting onto and using the WC	7	8	9
(d) Washing your hands and face	1	2	3
(e) Having a bath or all over wash	4	5	6
(d) Eating	7	8	9

7. Do you walk short distances without leaning on or holding onto something

Yes 1  
No 2  
Individual PROMPT  
(1) Indoors? Yes No  
(2) Outdoors? Yes No

8. Do you walk short distances with the help of something to lean on

Individual PROMPT  
(1) Indoors? Yes No  
(2) Outdoors? Yes No

9. Do you have any of the following walking aids?

PROMPT EACH INDIVIDUALLY  
Do you have any other walking aids?  
SPECIFY OTHER AIDS IN THE BOX BELOW

FOR EACH AID INFORMANT HAS (a) Do you use your .....  
aid indoors, both indoors and outdoors or do you never  
use it nowadays?

WALKING AID	POSSESSION		WHETHER USED			
	YES	NO	IN	OUT	BOTH	NOT USED
Stick	1	2	3	4	5	6
Walking frame	1	2	3	4	5	6
Tripod	1	2	3	4	5	6
Elbow crutches	1	2	3	4	5	6
Shoulder crutches	1	2	3	4	5	6
Canes	1	2	3	4	5	6
Other (specify)	1	2	3	4	5	6
	1	2	3	4	5	6

FOR EACH AID INFORMANT HAS BUT DOES NOT USE (CODE 6)

(b) Why don't you use your .....?

1.....

2.....



- PROMPT EACH INDIVIDUALLY  
FOR EACH AID POSSESSED (CODE 1)

(b) Did you or your family have to pay the full cost, a part of the cost, or nothing at all?

(c) Do you use the ..... nowadays?

(a) Do you have any other aids to help you in any way?

Other (specify)	1	2		3	4	5	6	7
	1	2		3	4	5	6	7
	1	2		3	4	5	6	7
	1	2		3	4	5	6	7
	1	2		3	4	5	6	7

- None

IF NONE (NONE 1) (a) Why haven't you got a wheelchair at the moment?

IF INFORMANT PERMANENTLY HAS NO WHEELCHAIRS GO TO Q89	DNA	X	QOTO 89
---	-----	---	---------

## THE WHEELCHAIR AND ITS SUITABILITY

112. In order to see if a wheelchair is

needs it is necessary to find out what kind of chair they have. I wonder if I could have a look at your wheelchair(s), [first the one you use the most?]

IF INFORMANT HAS MORE THAN TWO WHEELCHAIRS TAKE THE TWO THEY USE

THE MOST  
FOR EACH WHEELCHAIR FILL IN THE CHECK LIST BELOW

MAIN CHAIR	OTHER CHAIR
1	1
2	2
3	3
4	4

(a) Is whistleblower powered or non-powered, self or attendant context?

Powered self drive

Downloaded At: 11:52 11 September 2009

STRUCTURAL INFORMATION RELATION

### Gas-powered self-propelling

Non-powered attendant control

FOR SELF PROPELLING  
(COOK 3 AT A.)

Rear propeller wheels

Great emphasis should be placed on the importance of the

Western Hemisphere

five arm drive

we can drive left

Don't ask for help.

100

718 004

Didi Four new townships

from 1980

Single castor

Van castoree

Downloaded from <http://ajphaphysocpharmacology.physiology.org/> by guest on September 11, 2012

Shrestha et al.

Feelchair is rigid

ackrent in folding

subtree is fixed.

—

13. Does this wheelchair have any special modifications or adaptations, not necessarily official ones?

IF YES (CODE 1) (a) Would you describe them to me?

(1) \_\_\_\_\_

(2) \_\_\_\_\_

MAIN CHAIR

Yes No

1 2

ASK a

1 2

17. Did you get this wheelchair through the National Health Service or from somewhere else?

National Health Service  
Bought it myself  
Charitable organization  
Other (specify)

(1) \_\_\_\_\_

(2) \_\_\_\_\_

1 2 3 4 5

ASK a

1 2 3 4 5

14. INTERVIEWER'S ASSESSMENT of make and model of wheelchair

(1) \_\_\_\_\_

(2) \_\_\_\_\_

- IF WHEELCHAIR NOT OBTAINED THROUGH NHS OR AS A WAR PENSIONER (CODES 3-5)

(a) Why didn't you get this wheelchair through the National Health Service?

(1) \_\_\_\_\_

(2) \_\_\_\_\_

15. How long have you had this wheelchair?

Don't know  
Less than 6 months  
6 months, but less than 1 year  
1 year, but less than 2 years  
2 years, but less than 3 years  
3 years, but less than 4 years  
4 years, but less than 5 years  
5 years or more

8 9

1 2 3 4 5 6 7

16. Who first suggested that you needed this wheelchair?

No one  
Husband/wife  
Other relative  
Friend  
General Practitioner  
Technical Officer  
Other (specify)

(1) \_\_\_\_\_

(2) \_\_\_\_\_

1 2 3 4 5 6 7

ASK a

1 2 3 4 5 6 7

16. Apart from ones lent to you on a temporary basis only, is this the first wheelchair you have ever had?

IF NO (CODE 2) (a) Is this wheelchair a replacement of a previous one or is it an additional one?

Replacement  
Additional  
Other (specify)

(1) \_\_\_\_\_

(2) \_\_\_\_\_

1 2 3 4 5

ASK a

1 2 3 4 5

- IF NO ONE OR PRIVATE PERSON (CODES 1-4, 7)  
(a) Who did you, or the person who first suggested you needed this wheelchair, first contact?

General Practitioner  
Hospital Doctor  
Medical Authority  
NHS Doctor  
Technical Officer  
Other (specify)

(1) \_\_\_\_\_

(2) \_\_\_\_\_

1 2 3 4 5 6

ASK a

1 2 3 4 5 6

- 9 -

19. Did you visit a wheelchair clinic, not necessarily held at an Artificial Limb and Appliance Centre, before it was decided to give you this wheelchair?

Yes  
No

IF YES (CODE 1)(a) Which clinic did you go to?

(1) \_\_\_\_\_ (2) \_\_\_\_\_

(b) How did you travel there?

(1) \_\_\_\_\_ (2) \_\_\_\_\_

Amulance  
Other (specify)

(c) Was the journey to the centre/clinic difficult?

Yes  
No

IF DIFFICULT (CODE 1 AT(c)) (d) In what ways was it difficult?

(1) \_\_\_\_\_ (2) \_\_\_\_\_

20. What happened at the centre/clinic when you went there before it was decided to give you this wheelchair?

(1) \_\_\_\_\_ (2) \_\_\_\_\_

- 10 -

21. (Way I just check) did you try sitting in some wheelchairs when you were at the centre/clinic?

Yes - one  
Yes - more than one  
No

1 1  
2 2  
3 3

22. What did you or the person who pushes you, learn at the centre/clinic?

(1) \_\_\_\_\_ (2) Nothing

1 1

23. Was attending the centre/clinic very useful, useful or not very useful in learning how to use this wheelchair?

Very useful  
Useful  
Not very useful

1 1  
2 2  
3 3

IF NOT VERY USEFUL (CODE 3)

(a) In what ways was it not very useful?

(1) \_\_\_\_\_ (2) \_\_\_\_\_

ASK a

24. Do you think that by going to the centre/clinic you ended up with a better wheelchair than you would otherwise have done?

Yes  
No

1 1  
2 2

IF WAITED (026, CODES 2-8) OTHERWISE GO TO Q29

27. To what extent did this waiting period stop you getting about?

No effect - another chair  
No effect - too ill  
Other (specify)

(T)

(2)

28. (May I just check), when you were waiting did you have the use of another wheelchair?

IF YES (CONE 1) (a) Who supplied this other wheelchair?

(7)

Yes ~ Informant Husband/wife

Other relative  
Friend  
Hospital staff  
Other (specify)

20

on advice?  
on who delivered the chair  
nical Officer  
r (specify)

(2)

- 13 -

(b) Did they give you, or the person who pushes you, any hints on how to use and maintain this wheelchair?

CODE ALL THAT APPLY  
Yes - self  
Yes - attendant  
No

IF GAVE HINTS (CODES 1 & 2) (b) What did they say?

(1)

(2)

ASK b

1  
2  
31  
2  
3

31. Did you, or the person who pushes you, have any problems, however small, in learning to use this wheelchair?

Yes - self  
Yes - attendant  
No

IF YES (CODES 1 & 2) (a) What problems did you, or the person who pushes you, have?

(1)

(2)

ASK a

1  
2  
31  
2  
3

30. When you first got this wheelchair, were all the parts present and in good working order?

Yes  
No

IF NO (CODE 2) (a) What was wrong with this wheelchair?

(1)

(2)

ASK a

1  
21  
2

32. Were you given an instruction booklet with this wheelchair? Yes  
No

IF YES (CODE 1) (a) Who read the instruction booklet?

Nobody  
Myself  
Attendant  
Husband/wife  
Other relative  
Friend  
Other (specify)

(1)

(2)

IF SOMEONE READ (CODES 4-8)  
(b) What did you &/or they learn reading it?

(1)

(2)

(b) What did you do about it?

(1)

(2)

(c) Would you say the instruction booklet was very useful, useful, or not very useful in learning how to use and maintain this wheelchair?

Very useful  
Useful  
Not very useful

1  
2  
31  
2  
3ASK a  
QOTO 341  
21  
2QOTO 35  
ASK b3  
4  
5  
6  
7  
83  
4  
5  
6  
7  
8





38. Do you use this wheelchair at all these days?

Yes  
No

IF NO (CODE 2) (a) Why do you not use this wheelchair at all these days?

Short term illness  
Other (specify)

(2)

(1)

IF WHEELCHAIR IS A REPLACEMENT (Q16, CODE 3) OTHERWISE GO TO Q41  
DINA (Q16, CODES 1, 445)

40. Would you say this wheelchair is more comfortable, less comfortable or just as comfortable as the one it replaced?

More  
Less  
About the same

IF MORE OR LESS COMFORTABLE (CODES 1 & 2)

(a) In what ways is this wheelchair more/less comfortable?

(1)

(2)

IF WHEELCHAIR IS USED OR WOULD BE USED FOR SHORT TERM ILLNESS (Q35, CODES 1 & 3) OTHERWISE GO TO QUESTION 39, DINA (Q35, CODE 4)

39. Do you get aches and pains when sitting in this wheelchair?

Yes  
No

IF YES (CODE 1) (a) Where do you get these aches and pains?

(1)

(2)

(b) What could be done to this wheelchair to stop the aches and pains when you sit in it?

(1)

(2)

Nothing  
Other (specify)

ASK a

1 2  
2

Yes  
No

IF NO (CODE 2) (a) Why do you not use this wheelchair at all these days?

Short term illness  
Other (specify)

(2)

(1)

ASK a

1 2  
2

Yes  
No

IF NO (CODE 2) (a) Why do you not use this wheelchair at all these days?

Short term illness  
Other (specify)

(2)

IF YES (CODE 1) (a) Where do you get these aches and pains?

(1)

(2)

(b) What could be done to this wheelchair to stop the aches and pains when you sit in it?

(1)

(2)

Nothing  
Other (specify)

IF WHEELCHAIR IS A REPLACEMENT (Q16, CODE 3) OTHERWISE GO TO Q41  
DINA (Q16, CODES 1, 445)

40. Would you say this wheelchair is more comfortable, less comfortable or just as comfortable as the one it replaced?

More  
Less  
About the same

IF MORE OR LESS COMFORTABLE (CODES 1 & 2)

(a) In what ways is this wheelchair more/less comfortable?

(1)

(2)

41. Do you sometimes sit in an easy chair?

Yes  
No

IF YES (CODE 1)

(a) Would you say sitting in this wheelchair is more comfortable, less comfortable or just as comfortable as sitting in an easy chair?

More comfortable  
Less comfortable  
Just as comfortable

IF MORE OR LESS COMFORTABLE (CODES 3 & 4)

(b) What is this wheelchair more/less comfortable than an easy chair?

(1)

(2)

Q40 41

X

X

1 2  
2

Yes  
No

IF NO (CODE 2) (a) Why do you not use this wheelchair at all these days?

Short term illness  
Other (specify)

(2)

(1)

ASK a

1 2  
2

X

Yes  
No

IF YES (CODE 1)

(a) Would you say sitting in this wheelchair is more comfortable, less comfortable or just as comfortable as sitting in an easy chair?

More comfortable  
Less comfortable  
Just as comfortable

IF MORE OR LESS COMFORTABLE (CODES 3 & 4)

(b) What is this wheelchair more/less comfortable than an easy chair?

(1)

(2)

ASK a

1 2  
2

X

Yes  
No

IF YES (CODE 1)

(a) Would you say sitting in this wheelchair is more comfortable, less comfortable or just as comfortable as sitting in an easy chair?

More comfortable  
Less comfortable  
Just as comfortable

IF MORE OR LESS COMFORTABLE (CODES 3 & 4)

(b) What is this wheelchair more/less comfortable than an easy chair?

(1)

(2)

42. If you wanted to sit in this wheelchair and have a sleep could you comfortably do so?

Yes  
No

IF NO (CODE 2) (a) Why is that?

(1) \_\_\_\_\_ (2) \_\_\_\_\_

(b) Would you like to be able to have a sleep in this wheelchair?

Yes  
No

43. Does this wheelchair have any cushions, not necessarily ones supplied by the wheelchair service?

Yes  
No

IF YES (CODE 1) (a) May I just check does it have seat cushions? side cushions? back cushions?

INDIVIDUAL PROMPT

FOR EACH CUSHION ASK

(b) Was the ..... cushion provided by the National Health Service, did you provide it yourself, or what?

(c) What material is the cover of the ..... cushion made of?

(d) Do you use the ..... cushion all the time when this wheelchair is in use, some of the time or none of the time?

	(a) YES NO	(b) PROVIDED BY NHS SELF OTHER	(c) MATERIAL OF COVER	(d) USHS ALL SOME NONE
SEAT	1 2 3 4 5	1 2 3 4 5	1 2 3	1 2 3
SIDE	1 2 3 4 5	1 2 3 4 5	1 2 3	1 2 3
BACK	1 2 3 4 5	1 2 3 4 5	1 2 3	1 2 3

IF WHEELCHAIR HAS ANY CUSHIONS

44. Do you find this/these cushion(s) uncomfortable in any way?

Yes - seat  
side  
back  
No

IF YES (CODES 1-3) (a) In what way do you find the ..... (cushions) uncomfortable?  
REPEAT FOR EACH CUSHION FOUND UNCOMFORTABLE

(1)

Seat cushion

(2)

DNA

Side cushion

DNA

Back cushion

DNA

45. (Besides cushions), do you use a sheepskin or anything similar to sit on when you are using this wheelchair?

Nothing  
Sheepskin  
Other (Specify)

(1)

(2)

46. The width of a chair seat (interviewer to indicate) often affects how comfortable it is to sit in. Do you find this wheelchair too wide, too narrow, or just right to sit in?

Too wide  
Too narrow  
Just right

IF TOO WIDE OR TOO NARROW (CODES 1 & 2)

(a) In what ways does this make this wheelchair uncomfortable to sit in?

(1)

(2)

Too deep  
Too short  
Just right

(a) In what ways does this make this wheelchair uncomfortable to sit in?

1

US  
\$

	Comfortable	Uncomfortable
1. I am comfortable with my current level of physical activity	1.00	0.00
2. I am comfortable with my current level of mental activity	0.90	0.10
3. I am comfortable with my current level of social activity	0.80	0.20
4. I am comfortable with my current level of emotional activity	0.70	0.30
5. I am comfortable with my current level of spiritual activity	0.60	0.40
6. I am comfortable with my current level of intellectual activity	0.50	0.50
7. I am comfortable with my current level of physical activity	0.40	0.60
8. I am comfortable with my current level of mental activity	0.30	0.70
9. I am comfortable with my current level of social activity	0.20	0.80
10. I am comfortable with my current level of emotional activity	0.10	0.90
11. I am comfortable with my current level of spiritual activity	0.00	1.00

(2)

49. Do you find the backrest angle too upright, too much at an angle, or just right?

Too upright  
Too much an angle  
Just right

(2)	(1)

	Yes	No
<hr/>		

[illegible]

(11)

Comfortable  
Uncomfortable

(1)	—	(2)
-----	---	-----

49. Do you find the backrest angle too upright, too much at an angle, or just right?

Too upright  
Too much an angle  
Just right

(2)	(1)

☐ Yes

☒ No

[illegible]

(11)

Comfortable  
Uncomfortable

(1)	—	(2)
-----	---	-----

51. Does this wheelchair have a footboard, footrests, or anything similar?

(1) | (2)

Nothing  
Footboard  
Footrests  
Other (specify)

1  
2  
3  
4

ASK a

IF YES (CODES 2-4) (a) Do you use the ..... all the time, some of the time, or never?

1  
2  
3

CODE c

IF NEVER (CODE 3) (b) Why don't you use the .....?

1  
2  
3

ASK b

(1) | (2)

IF EVER USES (CODES 1 & 2) (c) Do your feet stay on the ..... or do they sometimes slide off or get caught?

1  
2  
3

CODE d

Remain on footrest  
Slide off  
Get caught

IF SLIDE OR CATCH (CODES 2 & 3)

(d) What happened on the most recent occasion?

(1) | (2)

52. May I just check. Does this wheelchair have any heel loops, foot straps, or anything similar?

(1) | (2)

None  
Heel loops  
Foot straps  
Other (specify)

1  
2  
3  
4

ASK a

IF YES (CODES 2-4) (a) In what ways do these help?

(1)

(2)

53. Have elevating legrests been fitted to this wheelchair?

None  
Left elevating  
Right elevating

1  
2  
3

ASK a

IF YES (CODES 2 & 3) (a) Do you find your wheelchair seat(s) comfortable or uncomfortable?

Comfortable  
Uncomfortable

4  
5

ASK b

IF UNCOMFORTABLE (CODE 5)(b) In what ways is it/are they uncomfortable?

(1)

(2)

54. Do you need help when you get in and out of this wheelchair or can you always do it unaided?

Always with help  
Sometimes with help  
Always unaided

1  
2  
3

ASK a

IF NEEDS HELP (CODES 1 & 2)

(a) Who helps you?

Husband/wife  
Other relative  
Friend  
Nursing staff  
Other (specify)

1  
2  
3  
4  
5

CODE ALL THAT APPLY

Yes  
No

1  
2

ASK f

IF YES (CODE 1) (f) In what way did it hurt you?

(1) | (2)

(b) Is somebody available to help you every time you get in and out of this wheelchair or only some of the time?

All of the time  
Some of the time

(c) Do you think something could be done to this wheelchair so that you could always get in and out by yourself?

Yes  
No

IF YES (CODE 3) (d) What could be done?

(1) (d)

55. Some people find getting in and out of a wheelchair one way easier than another. Do you get in and out from

RUNNING PROMPT the front of this chair,  
the side of this chair,  
or from another direction?

56. Can I just check, has this wheelchair got detachable, hinges, or fixed armrests?

Detachable  
Hinged  
Fixed  
No armrests

IF DETACHABLE OR HINGED (CODES 1 & 2)  
(a) Has anybody ever helped you get in and out of this wheelchair all of the time, some of the time, or do you never bother?

Always removed  
Sometimes removed  
Never removed

IF NOT ALWAYS REMOVED (CODES 6 & 7)  
(b) Why don't you (always) remove the armrests?

(1) (2)

57. Have you ever got stuck or been in difficulties when getting in and out of this wheelchair?

Yes  
No

IF YES (CODE 1) (a) What happened?

(1) (2)

(b) Did you hurt yourself?

(1)

(2)

(c) Do you think this accident could have been prevented in any way?

IF YES (CODE 1) (d) In what way?

(1) (2)





IF NEVER (CODE 5) (a) Why is this wheelchair never folded these days?

(1) \_\_\_\_\_ (2) \_\_\_\_\_

IF EVER FOLDED (CODES 1-4) (b) Are you able to fold this chair by yourself or do you need assistance?  
 Never needs assistance  
 Sometimes needs assistance  
 Always needs assistance

IF NEEDS ASSISTANCE (CODES 2 & 3)  
 (c) Why do you need assistance?

(1) \_\_\_\_\_ (2) \_\_\_\_\_

(d) Who helps you fold this wheelchair?  
 Husband/wife  
 Other relative  
 Friend  
 Living staff  
 Other (specify)

CODE ALL THAT APPLY

(1) \_\_\_\_\_ (2) \_\_\_\_\_

(e) Do you/they have any difficulty in folding this wheelchair?

Yes  
 No

IF YES (CODE 1) (f) What difficulties do you/they have?

(1) \_\_\_\_\_ (2) \_\_\_\_\_

IF WHEELCHAIR IS EVER FOLDED (CODES 1-4) OTHERWISE GO TO Q65.

64. On what occasions is this wheelchair folded?

INA (Q63 CODE 5)

CODE ALL THAT APPLY  
 (1) \_\_\_\_\_ (2) \_\_\_\_\_

65. Where is this wheelchair kept when it is not in use?

CODE ALL THAT APPLY  
 (1) \_\_\_\_\_ (2) \_\_\_\_\_

#### WHEELCHAIR USAGE

66. The wear on a wheelchair often depends on how often it is used and on the ways in which it is used.

- (a) On average, how many days a week do you use this wheelchair indoors, not necessarily moving around in, but including just sitting?  
 CODE 0 = NEVER CODE 8 = LESS THAN ONE DAY  
 (b) How many days a week do you use this wheelchair outdoors?  
 IF NEVER USES WHEELCHAIR INDOORS/OUTDOORS (ASK) FOR INDOORS/OUTDOORS.  
 (c) For how many hours do you normally use this wheelchair indoors/outdoors on a Saturday? PROMPT IF NECESSARY.  
 (d) For how many hours do you normally use this wheelchair indoors/outdoors on a Sunday?  
 (e) For how many hours a day do you normally use this wheelchair indoors/outdoors on other days?

	WEEK WHEELCHAIR				OTHER WHEELCHAIR			
	(a) INDOORS	(b) OUTDOORS	(c) INDOORS	(d) OUTDOORS	(e) INDOORS	(f) OUTDOORS	(g) INDOORS	(h) OUTDOORS
Number of days chair used	0 8 1 2 3 4 5 6 7	0 8 1 2 3 4 5 6 7	0 8 1 2 3 4 5 6 7	0 8 1 2 3 4 5 6 7	0 8 1 2 3 4 5 6 7	0 8 1 2 3 4 5 6 7	0 8 1 2 3 4 5 6 7	0 8 1 2 3 4 5 6 7
Number of hours per day	(a) SAT SUN	(b) OTHER SAT	(c) SAT SUN	(d) OTHER SAT	(e) SAT SUN	(f) OTHER SAT	(g) SAT SUN	(h) OTHER SAT

IF WHEELCHAIR IS USED INDOORS AT ALL NOWADAYS

(Q66 a, CODES 5, 1-7) OTHERWISE GO TO Q73.

DNA (Q66 a, CODE 0)

Powered chair

67. Do you move along in this wheelchair indoors by

Using handrims,

Paddling with your feet,

Someone pushing you,

or by some other method? (specify)

(1) (2)

IF WHEELCHAIR IS SELF PROPELLING BUT HANDRIMS ARE NOT ALWAYS USED (Q12a, CODE 3 & Q67, CODES 1-5) OTHERWISE GO TO Q69.

DNA (HANDRIMS ALWAYS USED)

68. Why don't you (always) use the handrims?

(1)

(2)

69. Does this wheelchair ever get stuck in passage ways, in turning corners or passing through doorways indoors?

Yes - passage ways

Yes - corners

Yes - doorways

No

CODE ALL THAT APPLY

70. Do you have any difficulty, however small, in using this wheelchair in going to the WC?

Yes

Never tried

the bathroom?

Yes

Never tried

the kitchen?

Yes

Never tried

INDIVIDUAL PROMPT

sitting at a table?

Yes

Never tried

reaching switches?

Yes

Never tried

reaching electric plugs?

Yes

Never tried

FOR EACH WHERE THERE IS ANY DIFFICULTY

(a) What difficulties do you have in using this wheelchair in

(1) (2)

Going to the WC?

The bathroom?

The kitchen?

Sitting at a table?

Reaching light switches?

Reaching electric plugs?

71. Although you may manage, what (other) difficulties do you have in using this wheelchair indoors?

(1) (2) None Other (specify)

1 2

72. Have you ever fallen from this wheelchair or had an accident when you have been using it indoors?

Yes No

IF YES (CODE 1) (a) Last time you had an accident did you fall forwards, backwards, sideways or

RECORD VERBATIM

COME ALL THAT APPLY

(1) (2) Fell forwards Fell backwards Did not fall Did not fall Other (specify)

3 4 5 6 7

IF WHEELCHAIR IS USED OUTDOORS AT ALL NOW/AINS (660b CODES 8.1-7) OTHERWISE GO TO Q 83

INA (660b, CODE 0) Powered Chair

X 1

73. Do you move along in this wheelchair outdoors by using handrims, somebody pushing you, or by some other method? (specify)

(1) (2)

2 3 4

IF WHEELCHAIR IS SELF PROPELLING BUT HANDRIMS ARE NOT ALWAYS USED (Q12a, CODE 3 & Q73, CODES 34d) OTHERWISE GO TO Q75.

INA (HANDRIMS ALWAYS USED)

X

74. Why don't you (always) use the handrims?

(1) (2)

X

QOTO 75

75. What difficulties do you have in leaving or entering your home when you are using this wheelchair?

None - does not use None - other Other (specify)

(2)

1 2 3

76. Can you, or the person who pushes you, propel this wheelchair over kerbs

RUNNING PROMPT easily, with difficulty, or not at all?

1 2 3

IF WITH DIFFICULTY OR NOT AT ALL (CODES 2 & 3) (a) What is the problem?

(1)

(2)

1 2 3

77. Do the kerbs around here have many ramps?

Yes No

1 2

78. Do you, or the person who pushes you, have difficulties in turning corners with this wheelchair?

Yes No

1 2

IF YES (CODE 1) (a) What difficulties?

(1)

(2)

1 2

ASK a

31. Do you take this wheelchair travelling by

INDIVIDUAL PROMPT		train?	Yes No	3 4	ASK
		car?	Yes No	5 6	ASK a
FOR EACH ITEM (a) why don't you take this wheelchair when travelling by.....?					
	(1)				
Bus	(2) CODE ALL THAT APPLY	Too ill Don't want to Travel by car Other (specify)		1 2 3 4	
Train		Too ill Don't want to Travel by car Other (specify)		1 2 3 4	
Car		Too ill Don't want to Other (specify)		1 2 3	
82. Have you ever fallen from this wheelchair or had an accident when you have been using it outdoors?		Yes No		1 2	ASK a
IF YES (CODE 1) (a) Last time you had an accident did you fall forwards, backwards, sideways or what happened?				3 4 5 6	
RECORD YES/NO					
	(1)	(2)			
83. IF WHEELCHAIR IS EVER PUSHED (Q67 CODE 4, Q73 CODE 3) OTHERWISE GO TO Q84.		RNA (wheelchair never pushed)		X	DDTD 84
		Now you mentioned earlier that somebody pushed you in this wheelchair. Who would that usually be?		1 2 3 4 5	
	(1)	SINGLE CODE Relative Friend Nursing staff Other (specify)			

(a) Would you please tell me their age?

Does..... suffer from any disability, however slight, or any illness that makes it difficult to push this wheelchair?

Yes No

IF YES (CODE 1) (c) What do they suffer from?

PHONE FULLY (1) (2)

84. Have you ever had a little grumble to anyone about this wheelchair, not necessarily to somebody from the wheelchair service?

Yes No

IF YES (CODE 1) (a) How many times have you had a little grumble? (1) (2)

(b) Who did you last have a little grumble to?

Husband/wife  
Somebody at ALAC  
Other (specify)

(c) What happened?

(1) (2)

(d) On the whole, were you satisfied or dissatisfied with the outcome?

Satisfied  
Dissatisfied

85. Has anybody, either a person working for the wheelchair service or a person who has carried out repairs, including minor ones, on this wheelchair?

Yes No

IF YES (CODE 1) (a) Who?

Official Repairer  
Technical Officer  
Husband/wife  
Other relative  
Other (specify)

CODE ALL THAT APPLY

(b) What did they do?

(STATE PERSON)

(1) (2)

86. Is this wheelchair in good working order at the present time?

Yes No

IF NO (CODE 2) (a) What is wrong with it?

(1) (2)

87. What could be done to make this wheelchair more suitable for a person with your disability?

Nothing

(1) (2)

88. On the whole, would you say you were very satisfied, satisfied, or not very satisfied with this wheelchair?

Very satisfied  
Satisfied  
Not very satisfied

## MOTOR VEHICLES FOR DISABLED DRIVERS

89. Do you drive an invalid three-wheeler or a car adapted for disabled drivers?

Neither  
Three wheeler  
Adapted car

1 QOTO 95

2 ASK a

3

4

IF YES (CODES 243) (a) What make and model is it?

Make..... Model.....

IF DRIVES INVALID THREE WHEELER OR ADAPTED CAR (Q89 CODES 243) OTHERWISE GO TO Q95.

90. How often do you drive this vehicle BMA (Q89 CODE 1)  
at least once a day, but at least once a week,  
less than once a week but at least once a month,  
or less than once a month?  
Never

X QOTO 95

1

2

3

4

5 QOTO 95

91. On what occasions do you use it?

Driving to work  
Going shopping  
Visiting friends/relatives  
Other (specify)

92. Do you have any difficulties in getting from your wheelchair into this vehicle?

Yes

No

1 ASK a

2

IF YES (CODE 1) (a) What difficulties do you have?

93. Do you have any difficulties storing your wheelchair in this vehicle?

Yes

No

1 ASK a

2

IF YES (CODE 1) (a) What difficulties do you have?

94. Have you heard of the orange or yellow car badge scheme?

Yes

No

1 ASK a

2

IF YES (CODE 1) (a) Do you belong to it?

Yes

No

2 ASK b

3

4

IF NO (CODE 4) (b) Why is that?

## THE WHEELCHAIR SERVICE

95. I would like to talk about the wheelchair service now and not the adapted car. If you could tell me what you know about the wheelchair service?

Nothing

1

96. If your wheelchair needed repairing or replacing what would you do? Don't know

1

97. How many years ago did you first start using a wheelchair, not necessarily a health one but excluding any lent to you on a temporary basis only?

Less than 1 year  
1 year, less than 2 years  
2 years, less than 3 years  
3 years, less than 4 years  
4 years, less than 5 years  
5 years, less than 10 years  
10 years or more

1

2

3

4

5

6

7

98. Have you ever been without a wheelchair because the one you were using was out of order or was taken away to be repaired or replaced?

Yes

No

1 ASK a

2

IF YES (CODE 1) (a) How did you manage without your wheelchair?  
PHONE FULLY

99. In what ways do you think the method of providing and maintaining wheelchairs through the National Health Service could be improved? No ways

1



Very satisfied  
Satisfied  
Not very satisfied

101. I would now like to ask a little about the accommodation you live in because it can affect the problems caused by using a wheel chair.

Purpose built flat/bedsitter for old or disabled person  
Purpose built bungalow for old or disabled person  
Other flat/bedsitter  
Other bungalow  
House  
Institution  
Other (specify)

12

103. Is this accommodation rented or is it owned by somebody in your household?

Private Person  
Charitable Organisation  
Other (specify)

Q4. What improvements would you like to see in this accommodation that would help you as a wheelchair user?

CODE ROOMS IN COLUMN (a)

FOR EACH ROOM INFORMANT DOES NOT GO INTO ASK

(b) Why don't you go into the .....?

(c) Do you find it inconvenient not being able to go into the .....?

(a)	(b)
-----	-----

REASON FOR NOT GOING INTO ROOM	INCON	NOT INCON
VALUES IN		
UTES NO		

1	2	3
4	5	6

2		2
---	--	---

1	2	1	2
---	---	---	---

--	--

	74	81
—	—	—

[illegible]

1	2	3
1	2	3

--	--	--

72

	1	0
--	---	---

1	2	3
---	---	---

2		CH
1		4

--	--	--

	1	2
1		
2		

--	--

1	2
1	2

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
---	---	---	---	---	---	---	---	---	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	-----

1	2
1	2

6	7	8
---	---	---

2		
---	--	--

106. Do you prepare any meals or snacks?

FF NO (CODE 2) (a) would you prepare any meals or snacks for the kitchen was adapted in any way?

FF YES (CODE 3) (b) In what way would the kitchen have to be adapted?

Yes	1
-----	---

No	2	ASK a
----	---	-------

Yes	3	ASK b
-----	---	-------

4	ON
---	----

100

IF INFORMANT PREPARES ANY MEALS OR SNACKS (Q106 CODE 1)  
OTHERWISE GO TO Q108.

107. Do you have any problems in preparing meals or snacks?

Yes  
No

IF YES (CODE 0) (a) What problems do you have?

Q107 108

X

ASK a

0

# ENVIRONMENTAL MEASUREMENTS

You are to measure any steps, ramps, doorways, gateways, narrow passage ways or awkward corners that informant has mentioned during the interview as causing difficulty to move using a wheelchair. These difficulties may be mentioned at questions 69, 70, 71 & 73 or at other times during the interview.

Measure height of steps, height and length of ramps, narrowest width of doorways and passages. If necessary draw diagrams.

A check list is provided below so that things can be ticked off when they are mentioned during the interview.

Check List	Tick when asked about during interview	Measurement
Steps		
Ramps		
Doorways to:		
.....		
.....		
Narrow passages		
.....		
Other (specify)		
.....		
.....		

1

2

ASK a

108. Are you responsible for doing the housework?

Yes  
No

IF YES (CODE 1) (a) Can you tell me any problems you might have?

109. May I just check, do you have a home help?

Yes  
No

IF INFORMANT IS MOTHER OF CHILDREN AGED UP TO AND INCLUDING 10 YEARS (HOUSEHOLD BOX) OTHERWISE GO TO Q111.

110. Do you have any difficulties in looking after your children?

Yes  
No

IF YES (CODE 1) (a) What difficulties do you have?

Q109 111

X

ASK a

1

2

111. Is there anything else you would like to say that hasn't already been covered in this interview?

Nothing

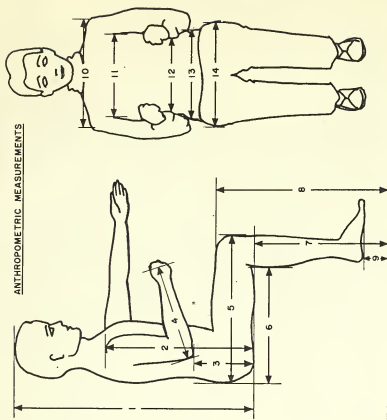
112. Would you mind if we sent somebody from the wheelchair centre to examine your wheelchair?

Yes  
No

1

2

## ANTHROPOMETRIC MEASUREMENTS

FOR CODING  
PURPOSES ONLY

INFORMANT IS SITTING IN A MODEL:		FOR CODING PURPOSES ONLY	
1	Sitting height (seat to top of head)		
2	Shoulder height (seat to shoulder)		
3	Elbow height (seat to elbow)		
4	Elbow to knuckle of small finger		
5	Back to the kneecap		
6	Ground to underside of the knee		
7	Ground to top of kneecap		
8	Ground to rear r/h corner of footrest		
9	Shoulder width		
10	Chest width		
11	Waist width		
12	Hip width		
13	Thigh width		
14			

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